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THE PROFESSIONAL'S RESOURCE FOR RESIDENTIAL ARCHITECTURE ■ Volume 5, Number 4 ■ Winter 2004 $6.00

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In this Issue

VOLUME 5 ■ NUMBER 4 ■ WINTER 2004 ■ WWW.PERIOD-HOMES.COM

Profile

Hail Columbia County, *by Eve M. Kahn*
On her clients' idyllic acreages, Kate Johns creates interpretations of old villas and farmhouses, each one a mixture of precedent and fancy. **6**

Features

Basic Principles of Traditional Construction, *by Stephen A. Mouzon*
In this excerpt from his new book, *Traditional Construction Patterns*, Stephen A. Mouzon covers some basics of traditional design. **11**

Avoiding Fenestration Fiascoes, *by Christine G.H. Franck*
Windows are one of the most expressive aspects of a house – what you do with them can make or break the design. **14**

Recent Projects

NEW DESIGN & CONSTRUCTION
Eclectic Masterpiece, *by Hadiya Strasberg*
A new private residence in southern Wisconsin, designed by Thomas Gordon Smith, achieves cohesion while expressing a multitude of influences. **18**

CONSERVATION
The Patina of Age, *by Hadiya Strasberg*
Greene & Greene designed every aspect of their 1908-09 Gamble House, which was in major disrepair by the 1990s; in August 2004, its first comprehensive conservation was completed. **22**

RESTORATION
Westcott Revisited, *by Marieke Cassia Gartner*
The only Prairie-style Wright house in Ohio, the Westcott House is a significant, if sometimes overlooked, part of Frank Lloyd Wright's oeuvre. **24**

Buying Guide Features

New Tile for an "Old" Roof, *by Hadiya Strasberg*
A clay-tile roof creates an aged look for a new residence in Cherry Hills Village, CO. **79**

Window Dressing, *by Roberta Lane*
Shutters retain their significance for historic buildings although their role has changed. **108**

The Cutting Edge, *by Martha McDonald*
Traditional glass manufacturing and detailing techniques are still practiced today by a number of skilled artisans and artists. **115**

The Final Touch, *by Dan Cooper*
Choosing the appropriate historical window hardware to match a residence can be more difficult than it seems. **129**

Book Reviews

Tales from the Blue Ox: A Hands-On Manual of Traditional Skills from the Blue Ox Millworks Historic Park, by Dan Brett, *reviewed by John Corbett* **141**

6,000 Years of Housing, by Norbert Schoenauer, *reviewed by Martha McDonald* **142**

Good Deeds, Good Design, edited by Bryan Bell, *reviewed by Nicole V. Gagné* **144**

The English House: English Country Houses & Interiors, by Sally Griffiths and Simon McBride, *reviewed by Nicole V. Gagné* **145**

The Forum

Who's Afraid of the Golden Section?, *by Steve Bass*
Steve Bass, AIA, discusses the battle between the rational and the romantic over the question of proportion in architecture. **146**

Departments

Calendar of Events 135
Product Literature 138

Buying Guides

Historical Products Showcase 27
Chimney Restoration & Construction. 56
Cupolas 59
Door Hardware 87
Doors & Entryways 98
Gutters & Leader Boxes 62
Metal Roofing 84
Metal Windows 105
Screen & Storm Doors 106
Screen & Storm Windows 134
Shutters & Shutter Hardware 112
Skylights 66
Slate Roofing 74
Specialty Glass 119
Tile Roofing 82
Weathervanes, Finals & Snowguards 69
Window Hardware 131
Window Repair 136
Wood Roofing 73
Wood Windows 121

On the cover: Thomas Gordon Smith of South Bend, IN, designed this residence on a breathtaking site in southern Wisconsin (see story p. 18). The house integrates a multitude of influences, functions and materials to make a balanced whole. *Photo: Alan McIntyre Smith*

Related Advertising

A

A&M Victorian Decorations, Inc. 46
A. Thayer Smith III, Inc. 44
A.B. Raingutters 50
AZEK Trimboards 29
Acorn Forged Iron 97
Adams Architectural Wood Products 127
Adelphi Paper Hangings LLC 48
Advent Design International 53
Al Bar-Wilmette Platers 91, 103
Allen Architectural Metals, Inc. 31
Allied Window, Inc. 135
Alpine Snowguards 72
American Period Design 46
American Restoration Tile, Inc. 48
American Slate Co. 76
Aquamaster Fountains & Aerators 53
Architectural Components, Inc. 124
Architectural Grille 47
Architectural Products by Outwater, LLC 5
Architectural Windows & Entries, Inc. 126
Arsco Mfg. Co. 47
Artistic Doors & Windows 123
Asselin SA 127
Authentic Designs 55
Auton Motorized Systems 43

B

Ball & Ball Hardware 35
Ball & Ball Lighting 35
Bartile Roofs, Inc. 81
Bathroom Machineries, DEA 52
Beech River Mill 109
Berger Bros. Co. 71
Bergerson Cedar Windows, Inc. 128
Bolection Door 103
Bradbury & Bradbury Art Wallpapers 45

C

CPFilms Inc. 117
Canaan Distributors 96
Castle Metal Products 75
Chadsworth's 1.800.Columns 2
Champlain Stone, Ltd. 57
Charles River Restoration Co. 68
Charleston Hardware Company 96
Chelsea Decorative Metal 50
Chimney Pot Shoppe, The 57
Christopher Thomson Studio 53
Classic Accents, Inc. 51
Classic Gutter Systems, LLC 63
Clawfoot Supply 45
Color People, The 50
Concrete Designs Inc. 41
Conklin's Authentic Barnwood 53
Coppa Woodworking 107
Copper House, The 71
Copper-Inc.com 60
CopperCraft, Inc. 60
Coppersmythe, Josiah R. 48
Country Road Associates, Ltd. 46, 55
Craftsmen Hardware Co. 96
Crown City Hardware Co. 89
Custom Trades International, Inc. 128

D

Davenport Hardware Co. 96
Deep Landing Workshop 55
Deer Park Stairbuilding & Millwork 50
Drums Sash & Door Co., Inc. 127
Durable Slate Co., The 75

E

E.R. Butler & Co. 147
EJMcopper Inc. 71
Earthcore Industries/Isokern 58
Enjo Architectural Millwork 126
Erik Wyckoff Artworks 103

Eugenia's Antique Hardware 94
Evergreen Slate Co. 75
Exhausto, Inc. 57

F

Fagan Design & Fabrication, Inc. 42
Fine Architectural Metalsmiths 46
Fireside Distributors 46
Fischer & Jirouch 46
Florentine Craftsmen, Inc. 42
Follansbee Steel 85

G

Gaby's Shoppe 53
Glass House, LLC 67
Good Time Stove Co. 50
Grabill Windows & Doors 128
Guerin, P.E. 93

H

H.T. Sales Company, Inc. 94
Hahn's Woodworking Company, Inc. 101
Hallidays America, Inc. 47
Hans Duus Blacksmith, Inc. 42
Hans Liebscher Custom Copper Works & Sheet Metal, Inc. . . .65
Heritage Veneered Products 103
Herwig Lighting 43
Historic Doors by Hendricks 104
Historical Arts & Casting, Inc. 148
House of Antique Hardware 94
Hyde Park Fine Art of Mouldings 39

I

Innerglass Window Systems 134

J

JMS Wood Products 55
James Peters & Son, Inc. 109
Johnson Millwork, Inc. 47
Joseph Millworks 101

K

Kayne & Son Custom Hardware, Inc. 94
Kestrel Mfg. 113
Kingsland Co. Doors 113
Kingsland Co. Shutters 101
Kolson, Inc. 95
Kremer Pigments, Inc. 52

L

La Compania Antigua 103
Lamson-Taylor Custom Doors 103
Lantern Masters, Inc. 45
Laser-Crafts 101
Lehmann Glass Studio 120
Leonard Metal Art Works 44
Liberty Brass Turning Co. 55
Liberty Cedar 73
Liberty Ornamental Products 42
Limestone Concept, Inc. 42
Ludowici Roof Tile, Inc. 83
Lundy's Ornamental Iron 130

M

M-Boss, Inc. 33
M.J. Mullane Co., Inc. 71
Maguire Iron Corp. 94
Maine Millstones 48
Manor Style, Inc. 54
Mitchell, D.C. 97
Mon-Ray, Inc. 105

N

NIKO Contracting 86
Nanz Custom Hardware, Inc. 7
National Association of Home Builders 37
Native Tile & Ceramics 44
New Concept Louvers 60
New England Thatch Co. 80
North Prairie Tileworks 42
Northern Roof Tile Sales Co. 80
Notting Hill Decorative Hardware 52

O

Oak Leaf Conservatories of York 67
Ohline Corp. 113
Old Smithy Shop 96
Old World Mouldings, Inc. 42
Olde Good Things 50, 95
Outhouse, The 60

P

Pagliacco Turning & Milling 48
Park City Rain Gutter 63
Parrett Windows 127
Patten Design 94
Pave Tile & Stone, Inc. 41
Phelps Company 133
Polar Blox, Inc. 71
Pollard Windows, Inc. 128
Ponds2Go.com 43
ProTech Systems/Ventinox 58

R

RainTrade Corp. 63
Reggio Register Co., Inc. 53
Reinke Shakes, Inc. 86
Renaissance Conservatories 67
Restore Media, LLC 52
Rohlf's Stained & Leaded Glass Studio 118
Roof Tile and Slate 77

S

Schiff Architectural Detail 42
Schwartz's Forge & Metalworks, Inc. 44
Scottsdale Art Factory 99
Seekircher Steel Window Repair Corp. 137
Select Millwork Co. 104
Sheldon Slate Products Co., Inc. 75
Sheppard Doors & Glass 101
Shutter Depot 109
Shuttercraft, Inc. 113
Signature Door Co. 101
Slate & Copper Sales Co. 64
Slate International 75
Sno-Gem Inc. 72
Solar Innovations, Inc. 68
South County Post & Beam 51
Steptoe & Wife Antiques 51
Steven Handelman Studios 55
Strybuc Industries 133
Sunrise Specialty Co. 51
Superior Moulding, Inc. 39

T

Tanglewood Conservatories, Ltd. 43, 68
Tendura 45
Texas Carved Stone, L.P. 41
Texas Metal Industries, Inc. 48
The Wagner Companies 54
The Wood Factory 107
Thermo-Press Corp. 134
Tile Roofs, Inc. 80
TileArt 44
Timberlane Woodcrafters, Inc. 110, 111
Titanium Custom Hardware 94
Triple-S Chemical 86
Tru-Vex Glass 118
Truth Hardware 133

U

Under Glass Mfg. Corp. 67
Urban Registers 54

V

Van Dyke Supply Co. 92
Versatile Sash & Woodworking 103
Victoriana East 107
Vintage Woodworks 107
Vixen Hill Shutters 109

W

W.H. Coe, Inc. 47
Weather Guard Building Products 63
Weathervane Sculpture 71
Weston Millwork Co. 128
White River Architectural Salvage & Antiques 55
White River Hardwoods-Woodworks 51
Wiemann Ironworks 47
Windsor One 49
Wm. J. Rigby Company 96
Wood Window Workshop 126
Woodline Co. 44
Woodstone Co. 124
Woolen Mill Fan Co. 46

Z

Zeluck Doors & Windows 125

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PERIOD HOMES (ISSN # 1531-2100) is published by Restore Media, LLC, 69A Seventh Avenue, Brooklyn, NY 11217. Subscription rate to professionals in architecture, interior design, construction and landscape design in the U.S. and possessions: $19.95/yr. (5 issues). Not available outside the U.S. Postal System.

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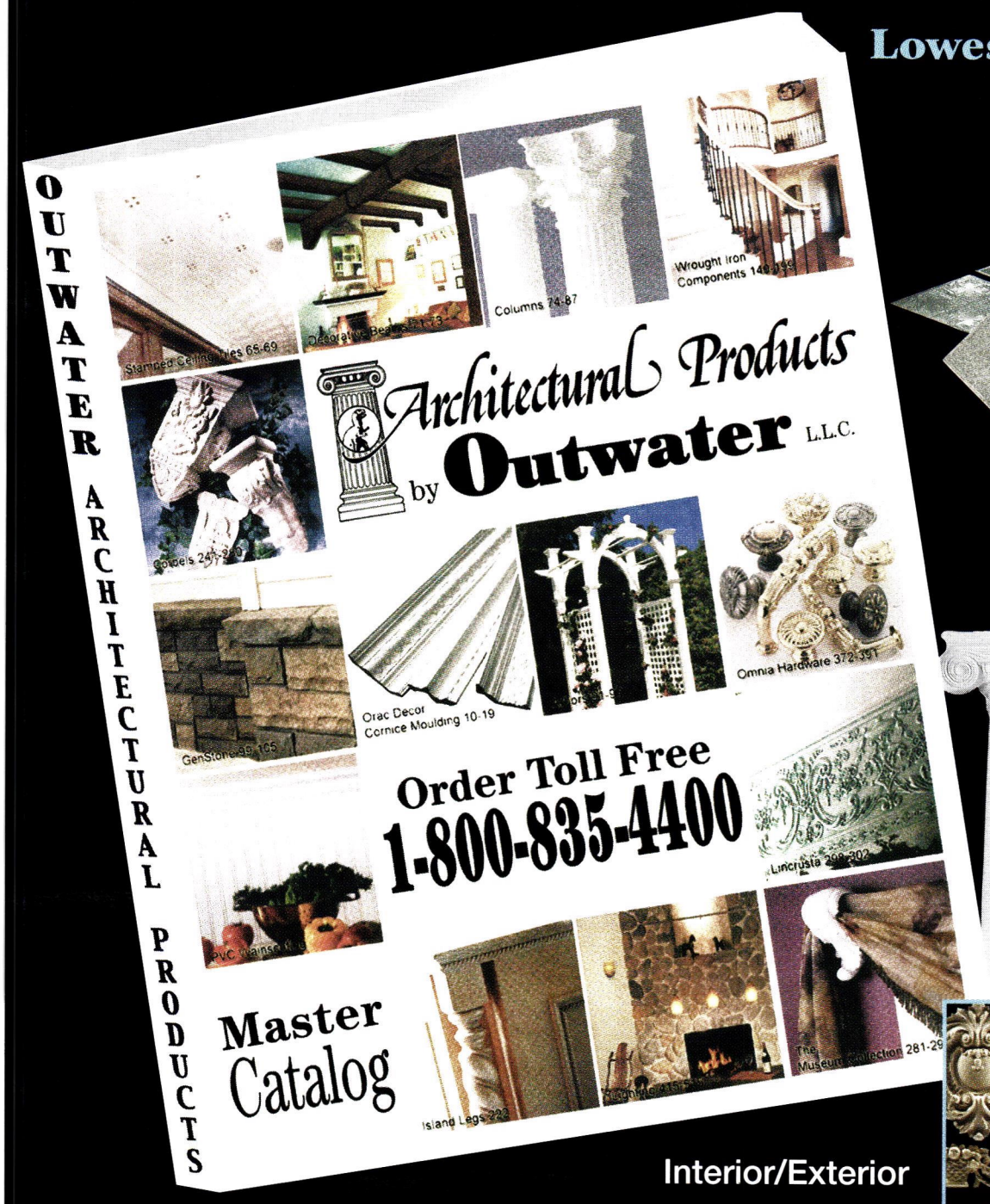

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WRITE IN NO. 5008

Hail Columbia County

A Manhattan architect transplanted to upstate New York has spent 20 years building inventive houses steeped in regional design traditions. *By Eve M. Kahn*

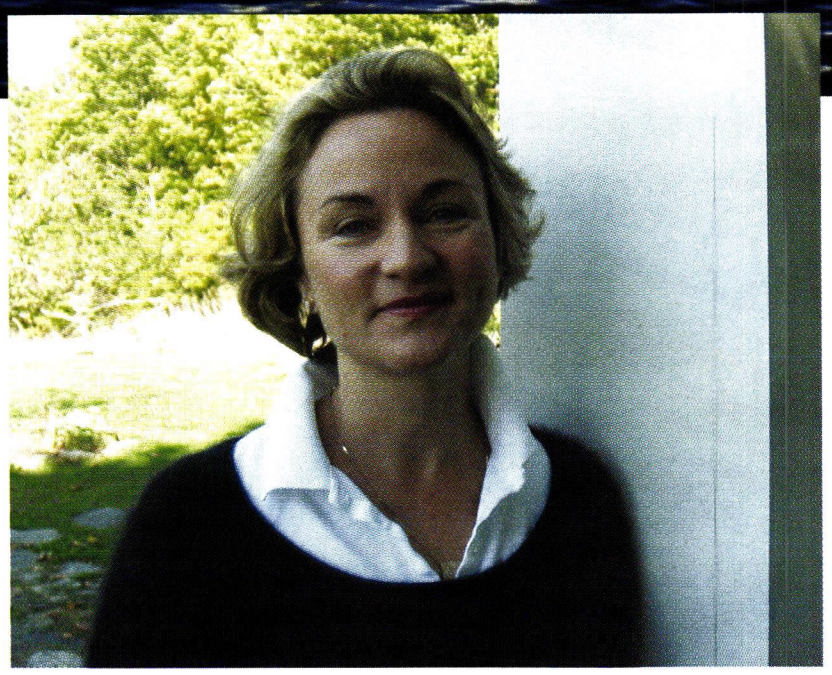
Kate Johns is so busy she needs another Kate Johns on staff. Here's a partial job description: Be available to travel often to newly excavated driveways at remote job sites around Columbia County, in upstate New York; the ideal applicant should know how to lay fieldstone house foundations angled for the area's quintessential views of rolling horse pastures, cornfields, weathered barns and gnarled orchards. The job also calls for making a house skin – from Ionic portico to bracketed cupola to standing-seam metal roof – look built in stages throughout centuries. Oh, and the employee should be well versed in the art of hiding streams of high-tech wiring within enfilades of rooms divided by archways and pilasters. (Still interested? E-mail resumes to kate@katejohnsaia.com.)

Johns is the preeminent Classical architect of her county, a 636-sq.mi. swath just south of Albany settled by Dutch and Quaker farmers. Their characteristic designs, eyebrow-windowed saltboxes segueing into Greek Revival mini-temples, have become sought-after commodities for both full-time residents and weekenders. The supply of affordable vintage homes is drying up, and those that haven't yet been renovated tend to be situated uncomfortably close to roadsides. On her clients' idyllic acreages, Johns creates interpretations of old villas and farmhouses, each one a mixture of precedents and fancy.

Johns has been known to transform vinyl-sided agglomerations of 18th- and 19th-century shacks into convincing images of Colonial farmsteads turned Colonial Revival around 1920. She's measured the smoking ruin of an 1830s farmhouse that burned due to faulty wiring, before rebuilding the place as it had been, but better, with more natural light and clearer circulation patterns. She's crowned a hilltop in a five-part manse with Adamesque refinement and symmetry, and dreamed up Gothic barns-turned-residences. On some byways, with names like Haddock Hill Road and County Road 17, Johns' works crop up again and again for miles.

"There's such beautiful architecture here to begin with, it's inspirational," she says. "I keep on taking mental notes, always."

Her 20-year-old firm, with three staffers, operates out of a converted gas station in a hamlet called Old Chatham. (Shortly before she moved in, the owner had clad its concrete walls in clapboard and applied a wood-shingle gabled roof that has grown a moss patina.) Hand-written yellow Post-Its are collaged on her desk, and few computers loom over the piled rolls of drawings. Technology-resistant, she only adopted CAD five years ago, put up a web site in 2002 and learned to send e-mail this summer. This fall, the office will move into a Greek Revival house on the main street in the nearby town of Chatham, with DSL access lines disguised by restored original paneling.



Kate Johns poses on the front porch of her farmhouse. *Photo: Janice Patterson*

Top: A manmade lake reflects porches and sunrooms across this Adamesque house's rear elevation. *Photo: John M. Hall*

She'll rarely get to enjoy the office much; she's usually juggling 30 projects at once. On a breezy afternoon last fall, she stood beside a fresh foundation for a new farmhouse that will have an artist's studio tucked under its shallow pediment. The breeze smelled of freshly excavated earth. Yet she modestly talked not about her own impact on the landscape, but rather about her contractors' skills.

"I've been using Gary Lowe for 15 years, sometimes on two projects at the same time. He's one of a number of contractors in this area who are master carpenters and have a real feel for historic detailing," she says. As for the excavator, Bob Boll, who'd just carved the driveway where an AT&T switching station had stood, Johns adds, "I have utter trust in him. He gets on the machine and just knows how the terrain should be, and the drainage is always right."

How many commissions she's completed to date is something of a mystery, but it numbers in the mid-three figures, mostly in Columbia County, but also as far afield as Virginia and Texas. They've ranged in scale from a porch addition to a 12,000-sq.ft. rehab. She's focused on residential projects, while also taking on a few offices, restaurants and churches (plus the Albany-quarried slate roof of a Queen Anne mansion-turned-museum where Franklin Delano Roosevelt's mistress once lived).

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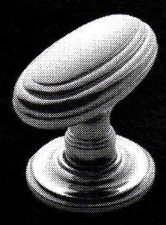
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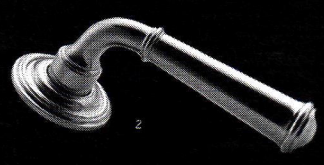
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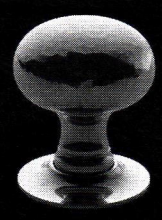
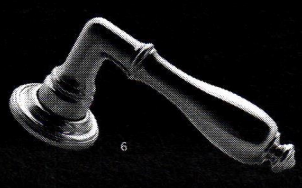

3

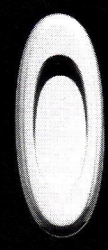
4

5

❶ No 1005 ENGLISH OVAL - FIVE SIZES ❷ No 2013 - FOUR SIZES / FOUR VARIATIONS ❸ No 1018 HAMMERED KNOB - EIGHT SIZES FOR DOORS AND CABINETS ❹ No 5825 DEMILUNE ESCUTCHEON - TWELVE VARIATIONS ❺ No 1205 GEORGIAN


6

7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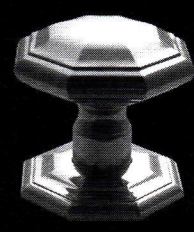
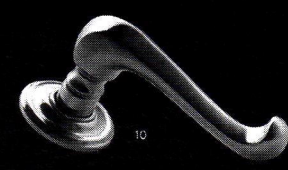
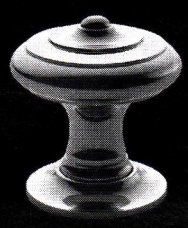
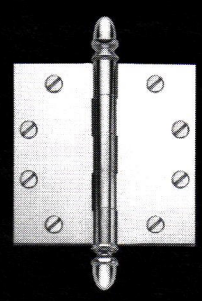

9


10

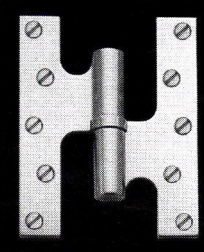
KNOB - EIGHT SIZES ❻ No 2135 EDWARDIAN LEVER - THREE SIZES ❼ No 8030 MODERNE KNOB - EIGHT SIZES ❽ No 6007 RECESSED PULL - THREE SIZES ❾ No 1240 FACETED OCTAGONAL KNOB - TWO SIZES ❿ No 2045 ART NOUVEAU LEVER -


11

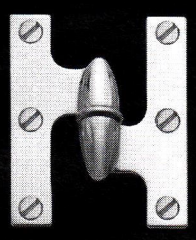

12

13

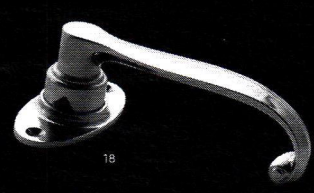
14


15

TWO SIZES ⓫ No 1003 GEORGIAN KNOB - EIGHT SIZES ⓬ No 3045 HINGE - NINE SIZES / FIFTEEN FINIAL DESIGNS ⓭ No 1421 PORCELAIN KNOB IN BLACK, WHITE OR BISCUIT ⓮ No 1114 ACANTHUS LEAF OVAL KNOB ⓯ No 3764 PAUMELLE


16

17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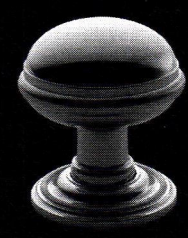
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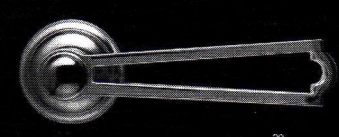
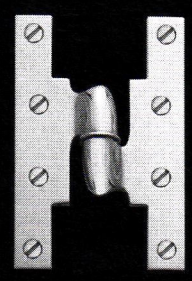

20

HINGE FOR DOORS AND CABINETS ⓰ No 3001 OLIVE KNUCKLE HINGE - FIVE SIZES ⓱ No 1085 ROPED KNOB - EIGHT SIZES ⓲ No 2008 AMERICAN AESTHETIC LEVER ⓳ No 1209 BANDED KNOB - EIGHT SIZES ⓴ No 2533 RENAISSANCE

21

22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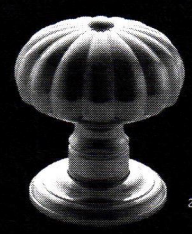
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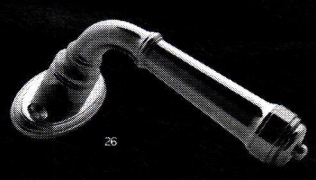
REVIVAL OPENWORK HANDLE ㉑ No 1016 SPHERICAL GLASS KNOB ㉒ No 1011 BULLSEYE KNOB - EIGHT SIZES ㉓ No 3004 INTERNAL BEARING OLIVE KNUCKLE HINGE ㉔ No 1053 MELON KNOB - FIVE SIZES ㉕ No 1128 SIMPLE DRUM-SHAPED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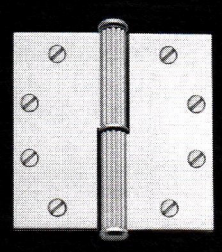
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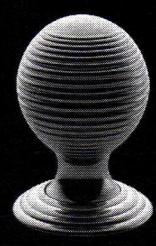
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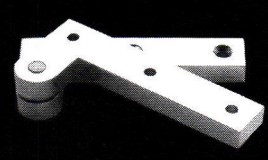
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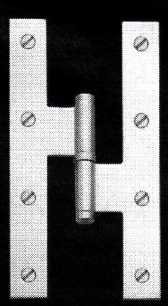
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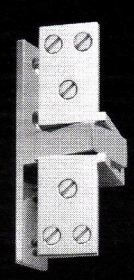
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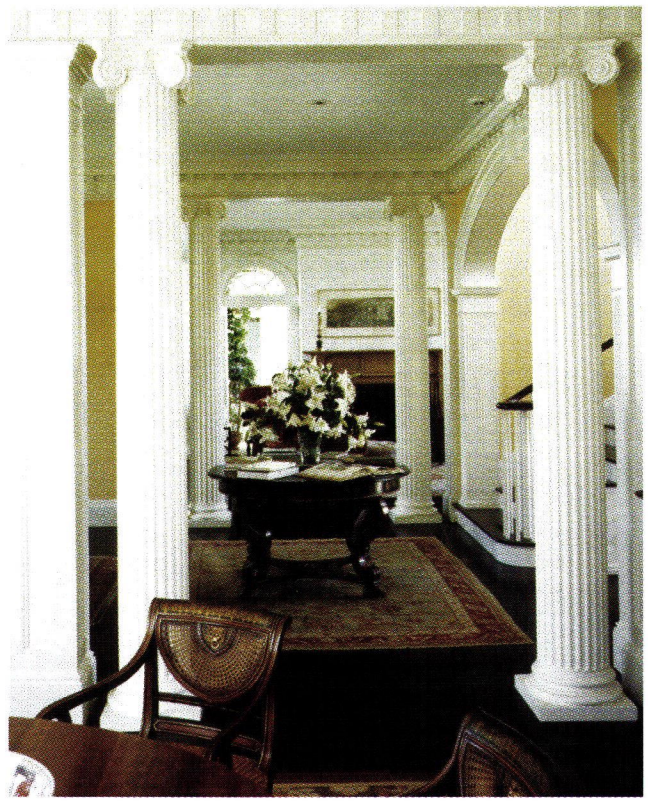
Each room in this five-part house offers views of the surrounding pastures, cornfields and orchards. *Photo: John M. Hall*

Curves on the banisters echo the foyer's elliptical arch. *Photo: John M. Hall*



A mixture of stock columns and custom moldings ornament the house's enfilade of rooms. *Photo: John M. Hall*

"I think I last updated my project list 10 years ago," Johns laughs. "It would be really interesting to figure out the total. But who has time?" In her off hours she's raised two children with her husband Jason Shaw, a lawyer and part-time judge she met when they were first graders in New York City. They live in a former wreck: a 1780s Dutch farmhouse with an 1890s addition. She's fronted the newer portion in tapered piers, so it seems to date to the 1810s. In the backyard, on a spacious chicken coop she designed for the family flock, she installed 6/6 window sash salvaged from a stash of architectural elements in the builder's barn. It was the first of two chicken habitats she's built: the other, an octagonal outbuilding surrounded by a netting cage on Haddock Hill Road, technically counts not as a coop but rather an aviary.

Her practice has grown purely by word of mouth. A number of her repeat customers are now downsizing – that is, they're selling their first Johns house and commissioning another. The only other tradition-friendly architects in the area, she explains, either focus on commercial preservation or give just a few nods to the past – gables, shingles – and then leave out the needed moldings and muntins. "People come to me knowing exactly what kind of work I do, and wanting exactly that," she says, "and knowing that I'll be involved hands-on with every detail."

Artistic License

For four generations so far there've been artists and free-thinkers in Johns' family. Her paternal grandfather, himself the son of a marine painter, illustrated Madison Avenue ads for Packard cars and Arrow shirt collars. Her paternal grandmother, a fashion illustrator, worked on avant-garde magazine covers for Harper's Bazaar with art director Alexey Brodovitch. A great-uncle, Arthur B. Carles, was an influential abstract painter and teacher in Philadelphia. Johns' father Craig is a widely exhibited realist painter, and her mother Margaret was a pastel painter as well as a pioneering animal behaviorist, who studied mammals' reactions to pheromones. Her sister, Sara Johns Griffen, heads a nonprofit group that supports Olana, the Orientalist mansion-museum built by Hudson River School painter Frederic E. Church. During the 1960s, Kate and Sara grew up among artists, assorted bohemians and Italian immigrants in Greenwich Village. On weekends, her father drove them around the New York and Pennsylvania countryside, admiring old houses. "I think he was a closet architect," Johns says.

As an undergrad surrounded by Modernists at Arizona State University's architecture program, Johns recalls, "People would come to watch the spectacle whenever I gave presentations. The professors didn't know what to make of me. For one studio, I watercolored Beaux Arts renderings of a traditional European-style hotel, with terraces down to a lakefront. The professors were appalled. But one of the critics worked for a big hotel

Above: At a 1919 Georgian Revival House in Virginia, Johns salvaged the original fireclay laundry sinks and backed them in beadboard. *Photo: Kate Johns*

Left: Johns added a double-decker porch to the house that features a glazed Doric base supporting an Ionic open-air tier. *Photo: Kate Johns*

From a neglected Colonial farmhouse surrounded by decrepit additions, Johns created an elegant U-shaped compound. *Photo: Michael Fredericks*

company, loved the design and wanted to build it! I learned to be strong, to be committed even when almost everyone was discouraging me. I had to get special dispensation to take the one serious history course available, taught by Marcus Whiffen, who'd written a seminal work on Colonial Williamsburg. I use what I learned from him every day – about how the Classical idiom has been such a rich source of invention. There's not one way to work with it, and there never has been."

When Shaw started law school at Tulane, Johns took jobs first with the Historic American Buildings Survey, documenting Baton Rouge structures for the National Park Service, and then with the preservation firm of Koch & Wilson in New Orleans. She pored through archives at the firm, which was founded in the 1930s: "The files are full of drawings of Mississippi plantation houses that had been burned or altered." Her colleagues introduced her to A. Hays Town, the eminent Louisiana traditionalist, then in his 70s. He gave her tours of his recent buildings, their Creole Revival enfilades reminiscent of the antebellum structures she'd been documenting.

In 1980, she and Shaw moved to New York, where she specialized in terra-cotta façade restoration at the Ehrenkrantz Group: "There I'd be 40 stories up on swing scaffolding, tapping every inch of a hollow and cracked cornice extending 10 feet over the street." Once their growing family overwhelmed their Brooklyn apartment, they bought their 100-acre farm on a gravel road (which, as empty nesters, they now share with a West Highland terrier and a German shepherd).

The first time she had a foundation poured for a paying customer, she says, "I felt so

A conservatory with a varnished beadboard ceiling resembles a Greek Revival porch that was later glazed. *Photo: Michael Fredericks*

Above: The house's back wings embrace a planting bed for herbs. *Photo: Michael Fredericks*

Right: The owners of this house requested an emphatic color scheme of teal and tomato for the kitchen, based on the palette of Carl Larsson, an early-20th-century painter/ interior designer in Sweden. *Photo: Michael Fredericks*

A Greek Revival Revival villa, with flush siding and fluted Tuscan portico columns, has arisen where a 1950s cabin once stood. *Photo: Kate Johns*

lucky! I've had wonderful clients with great taste and beautiful sites. There's a growing number of weekenders who are building homes with the thought of retiring here someday. This has turned out to be a great area for me to have chosen."

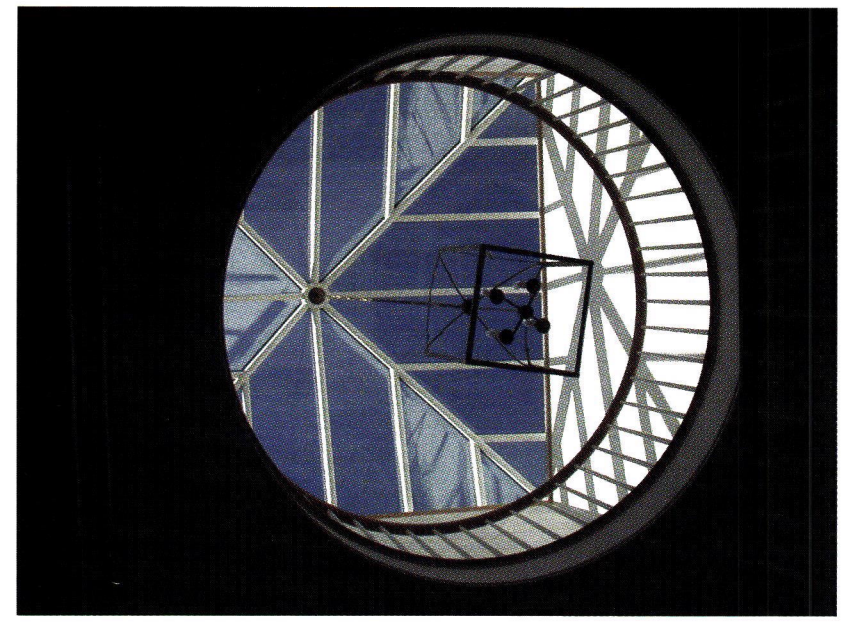
Painterly Compositions

At her latest Greek Revival Revival, a skylighted monitor rises above a row of filigree windows. On the interior's mahogany doors, nickel doorknobs gleam – "they're as close as you could come to the silver-plated hardware you see in the South, without going wild," Johns explains. In the kitchen, a reeded pilaster near the refrigerator is secretly a roll-out cabinet, its shelves conveniently open on both sides. In the basement, a roomful of wiring provides centralized controls for everything from the sound system to the skylight panes.

The house seems a bit sophisticated for its wooded setting, where a 1950s cabin once stood. (Johns incorporated the older structure's shell into a cathedral-ceiling great room just off the kitchen.) But the architect has persuasive local precedents in mind. The back roads, she points out, are full of unexpectedly grand houses, at settlements that started out promising but faded when rails or main roads were rerouted.

Columbia County is now experiencing some growing pains, she adds. The communities of course enforce zoning rules but don't impose any aesthetic standards of what's built in the countryside, and don't always carefully control change in historic districts. "There aren't quite McMansions yet," Johns says, "but there is development pressure, as more and more people live here full time. And there'll be more of a bedroom-community effect as big biotech companies come in around Albany." While providing custom luxuries in most of her designs, she's also created standard shingled house plans for a development near Albany called Shaker Bay. She wants to share more of her expertise with a broader population, no matter how busy her office gets.

"I would love to design small, modular, affordable houses in traditional styles," she says. "Modular, so the architect could control the quality of the construction, and not have some builder leave off the crown moldings or put in ghastly snap-in muntins. I'd love to be involved perhaps in a New Urbanist project, to have a chance to affect the wider landscape. That would be a wonderful challenge." ■



Above: To maximize natural light within a traditional design idiom, Johns often provides skylights on monitors or cupolas. *Photo: Kate Johns*

Left: Under a hip roof of standing-seam Galvalume, the filigree window grilles have a pattern of intersecting loops evocative of butterflies. *Photo: Kate Johns*

In restoring this brick 1840s Italianate, Johns discovered that its window sills were granite and the window trim carved mahogany. *Photo: Christopher Billingham*

Top: A Gothic Revival Revival compound, with a sequence of "big house, back house, little house, barn," pays homage to the traditional farmsteads of New England. *Photo: Geoff Miles*

Left: On the charred foundation of an 1830s farmhouse that burned because of faulty wiring, Johns re-created the house with larger windows and improved circulation patterns. *Photo: Craig Johns*

Basic Principles of Traditional Construction

Massing, proportion, symmetry and rhythm are all essential elements of traditional design. In this excerpt from his new book, *Traditional Construction Patterns* (The McGraw-Hill Companies, 2004), *Stephen A. Mouzon* discusses some basic principles.

The basic principles of traditional architectural languages resemble the rules of grammar of spoken languages. No quantity of fancy words is of any profit if the speaker does not know how to put them together according to the basic rules of grammar. Similarly, if the basic principles of traditional construction are violated, no amount of good detailing can rectify the situation.

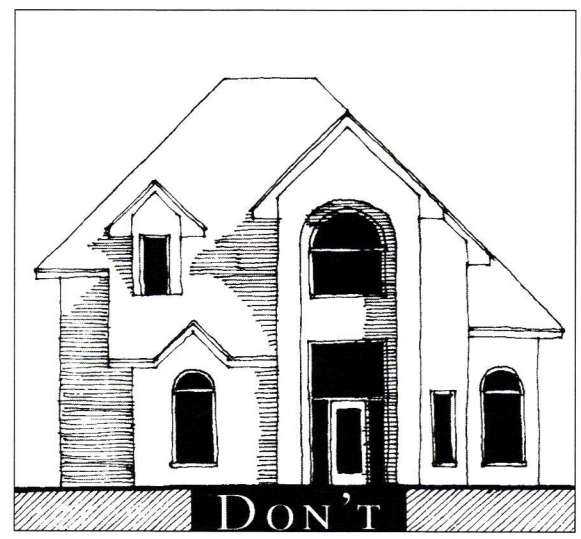
Configuration Notes

All the configurations noted here are subject to revision according to good local precedent, which typically means buildings built before 1925 that are good examples of their styles.

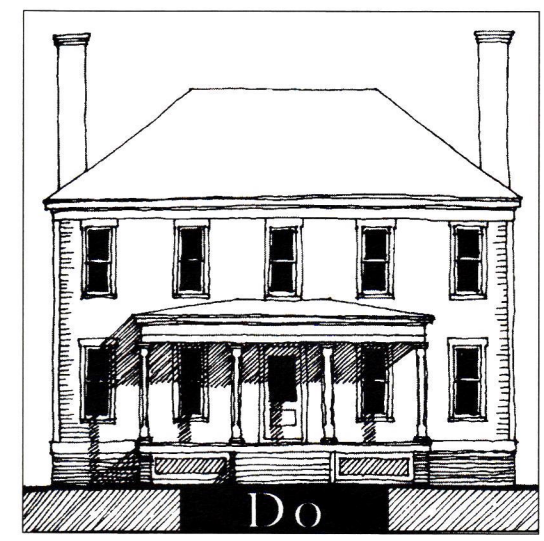
Why 1925? Prior to the 1920s, different styles were promoted almost exclusively by their champions, who believed that their style was superior to those of their predecessors. The styles often were based on some of the same precedents as their predecessors, but the new generation of "style champions" set their work apart with refinements particularly appropriate for the needs of the day. By 1925, however, the Modern movement had siphoned off most of the talent in the architecture profession, leaving traditional architecture in the hands of style merchants who didn't care what style they sold. In most cases, these merchants were the builders and their designers.

Read the house plan books of the era, and you will notice a subtle but important change in tone. Rather than arguing passionately for a particular style, these books most often make the case for the value of their plans based on their economy rather than on their style. It seems a bit strange today, but some house plan books from the mid 1920s didn't even list the square footage of the house, but rather listed the cubic footage. Lower cubic footage was considered better, since that meant that there was less air to heat. And you will also notice that they usually encompassed a wide range of styles. "Would you care for a Mission style? How about a Colonial? Or maybe you'd rather have an Arts and Crafts house? Pick a style, any style; we've got them all..." seems to have been the prevailing message.

This was all happening in the years leading up to the Great Depression. Once the Depression began, the focus on value kicked into overdrive. And if value is the only thing left to sell, then what's the purpose of all the Mission-style detailing, or the Colonial detailing or the Arts and Crafts detailing? The Great Decline of Architecture that began in the mid 1920s accelerated furiously after 1929. The only good body of work built during the Depression years was the simplest vernacular houses of the mid 1930s that had to be creative in order to be cheap enough to be affordable. The only good body of work during the war years was the simplest military architecture of necessity. However, the end of the war left us left with nothing but the icon of architectural soullessness: the brick rancher.



Don't use complicated forms. Too many gables, dormers and roof breaks waste thousands. Throwing away this kind of money on "street appeal" isn't necessary in neighborhoods where the streets themselves have appeal. This type of house usually spends so much money on the front that no budget remains for detailing on sides or rear, where the owners spend all their outdoor time.



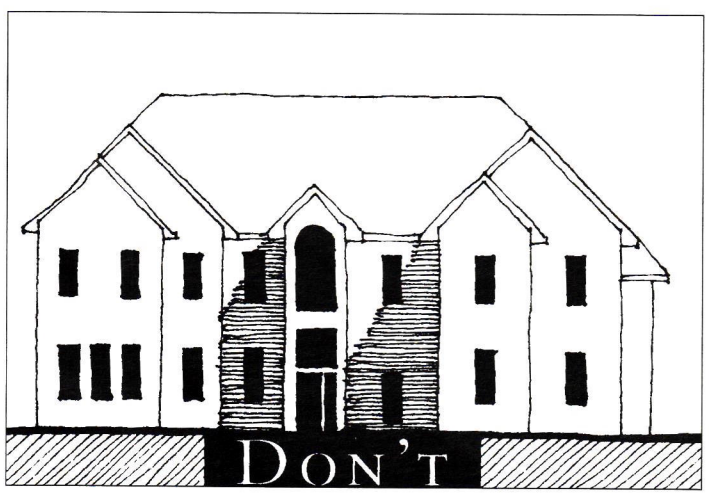
Do keep massing simple. Composing a house of one or a few simple boxes saves tremendous amounts of money for more effective things like proper porch detailing, back porches, garden walls, frontage fences, pergolas and a number of other things that help the owners enjoy inhabiting all of their property.

So although some good traditional work certainly was being done up to World War II and a tiny remnant of talented traditional architects persevered all through the dark decades of the 1950s, 1960s and 1970s, most of the buildings built since 1925 should be discounted as good examples of a traditional style. Well-executed buildings before this date are the best source of appropriate local precedent.

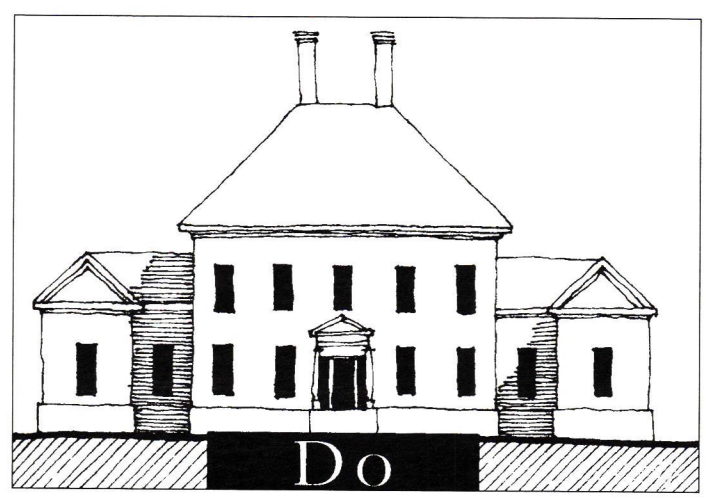
Simplicity of Massing

The root of nearly all traditional architectural massing is simplicity. Go back to the buildings that are the foundation of almost any style, and you will find a simple volume or an assembly of simple volumes.

The reason for this pattern is the fact that most traditional architecture is based in necessity and economy. The seed buildings from which most styles grew or developed were usually simple, utilitarian buildings that nonetheless resonated strongly with the culture, the climate and the available materials of the places where they were built. Such buildings were often built by hand and were usually constructed by their owners and their extended families. This meant that elaborate shapes or extra complications could cost days of additional hard manual labor. These simple, resonant seed buildings were then discovered and appreciated by trained designers who distilled and formalized them into a particular style. The simple massing of the style, however, usually remained in the formalized version.

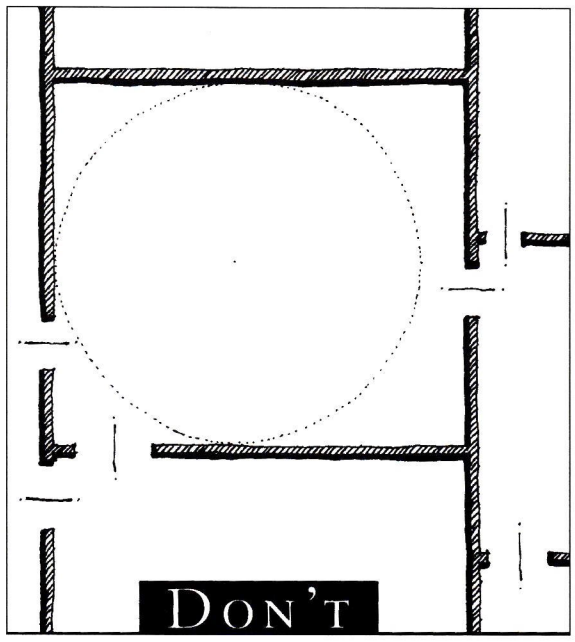


Don't clump everything equally under one enormous roof. Many McMansions with a confusing assembly of gables show the guests at first glance neither the entry nor the principal rooms of the house. All buildings should pass the First Glance Test, but many McMansions fail miserably.

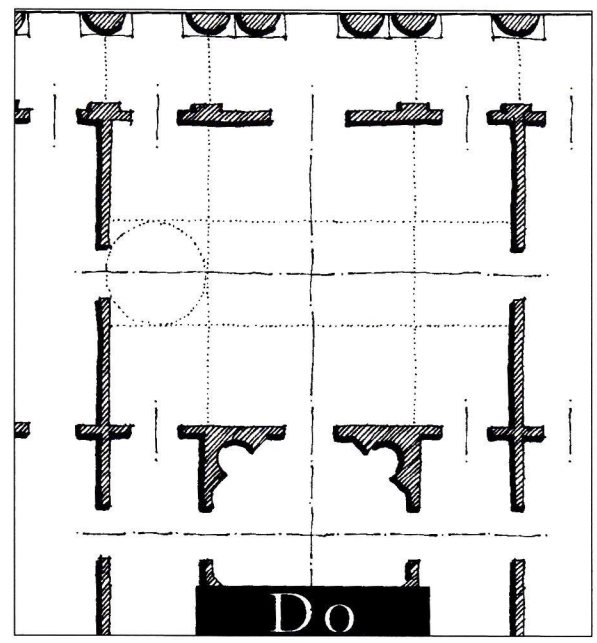


Do mass a house so that it passes the First Glance Test. Massing of a house should clearly show two things at first glance: the location of the main body of the house and the location of the entry for people, which ought to be more important and more noble than the car entry.

The Shingle style of the late-19th century is a great example of this pattern. One man, Stanford White, formalized this style and, while it produced some of the grandest homes of the Gilded Age, it was nonetheless based on the simple shingled boxes of Nantucket and Cape Cod. Even a style such as this, which was capable of some of the most elaborate structures ever seen in the United States, usually has a simple main building mass at its core. Other styles, such as the Federal, remain nothing more than simple boxes, no matter how large the building becomes.



Don't use arbitrary proportions. This drawing illustrates arbitrary proportions in a floor plan. No wall length has any particular relationship to any other wall length, nor do the door locations have any particular proportional relationship to the walls. The same principles apply to elevations.



Do create simple, harmonious proportions. Repeated rhythms stack the deck in your favor in the creation of simple, harmonious proportions.

No matter what the style, therefore, traditional architecture is usually characterized by simple masses to which other simple masses are added according to the needs of the building. And in every good example, this translates to building shapes that are rational and sensible.

Hierarchy of Massing

Almost all traditional architectural languages embody a clear hierarchy of massing when buildings are large enough to be composed of more than a single volume.

The most important or most public functions should be located in the largest, most prominent part of the building, which is usually called the "main body." Less prominent or less public functions occur in wings, which are sometimes called "back buildings." Other utilitarian or totally private functions occur in "outbuildings," which were once called "dependencies."

The clearest examples of this pattern occur in the buildings of Andrea Palladio and his legion of admirers in the centuries since the beginning of his career. The iconic version of Palladio's so-called "winged device" was a large main building and two side buildings connected to the main building by "hyphen buildings," or connectors. Everything from Thomas Jefferson's Monticello, to the U.S. Capitol to thousands (or possibly millions) of humbler buildings around the world, have been built according to this pattern.

There are many less formal examples of this pattern. A clear vernacular example is the American farmstead. The main body is often a two-story structure, surrounded by smaller structures that may be a cottage for Grandma, the smokehouse, the dairy, guest quarters or a carriage house, or may serve any number of other functions. These functions are usually arranged by their relative formality or utility rather than by their location on the spectrum of public to private, since farms seldom had neighbors nearby. Here, the porch or the covered breezeway often served as the "hyphen" to connect some or most of the various elements.

Simplicity of Proportion

Most great architecture is built around a collection of simple proportions found in nature and music that include the rational (1:1, 2:1, 3:2, 4:3, etc.) and the irrational (the square root of 2 and the Golden Mean).

Simple proportions are usually found in more Classical buildings, because architects realize that these proportions "resonate with the universe," in one man's words. Simple proportions, when found in vernacular buildings, are usually there for less lofty reasons, such as the fact that it's just easier and less expensive to build things when the dimensions aren't complicated. Things are also more likely to line up with each other when the proportions are regular. Structural necessities sometimes mandate simple proportions, such as the need for a circular dome to be located over a square room or a room of another shape but in a 1:1 proportion.

But whatever the reasons, simple rational or irrational proportions resonate throughout nature. In music, 2:1 is the ratio of the wavelengths of an octave; 3:2 is the ratio of the perfect fifth, while 4:3 is the ratio of the fourth. 1:1 is the proportion of a circle, which corresponds to objects ranging from the human eye to the earth itself (and the sun and the moon, of course). The Golden Mean is found in everything in nature from the shape of a nautilus shell to the curve of a ram's horn. Clearly, it makes sense to build things that are in harmony with proportions that come so naturally to the physical world.

Symmetry of the Face

Almost all traditional architecture reflects the bilateral symmetry of the human face in some way at the entry of the building. Most machine-based architecture is faceless.

The human body can stand at attention, symmetrical in every feature about the vertical central axis of the body, just as the more formal traditional buildings do. The human body can also take uncounted relaxed poses, some with the limbs slung seemingly everywhere, and more relaxed buildings can do the same. The insides of a human body are asymmetrical, because they are simply doing their job, just as the floor plan of a building is more likely to be asymmetrical because of the many functions that the different rooms must perform. But no matter what the rest of the body does, unless a person is trying to distort his or her face to frighten a young child or make an older child laugh, the human face is always bilaterally symmetrical. You can't throw your left eye or your nose over the back of a sofa as you might do your arm. Yet this is what many buildings appear to do.

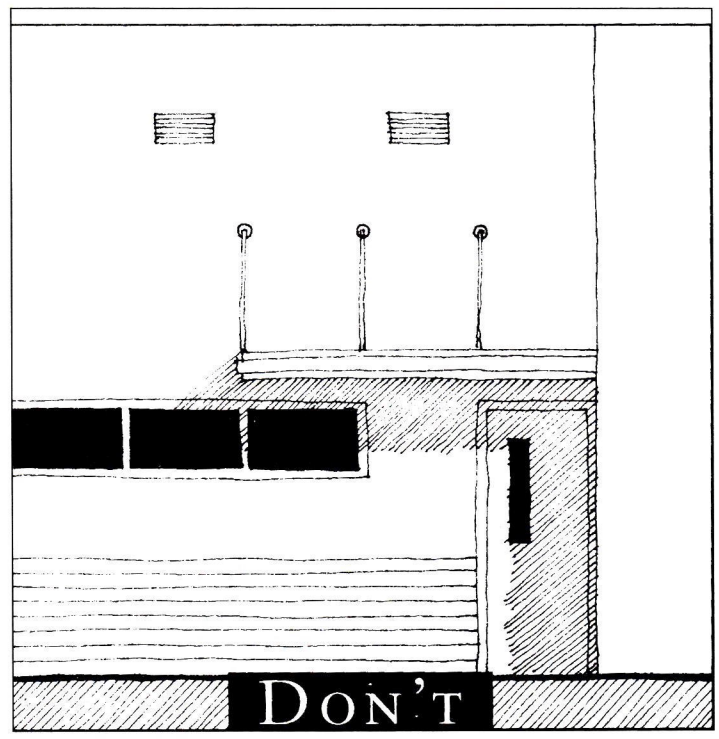
Again, traditional architecture takes its cues from the human body. The face of the building is the place where you enter. The area surrounding the entry of buildings of almost every traditional language of architecture has elements that reflect the symmetry of the human face, no matter how composed or how relaxed the rest of the building is. Without these symmetrical elements, the building would seem to be faceless, which is exactly what machine-based architecture usually works so hard to create.

Regular Arrangement of Columns and Openings

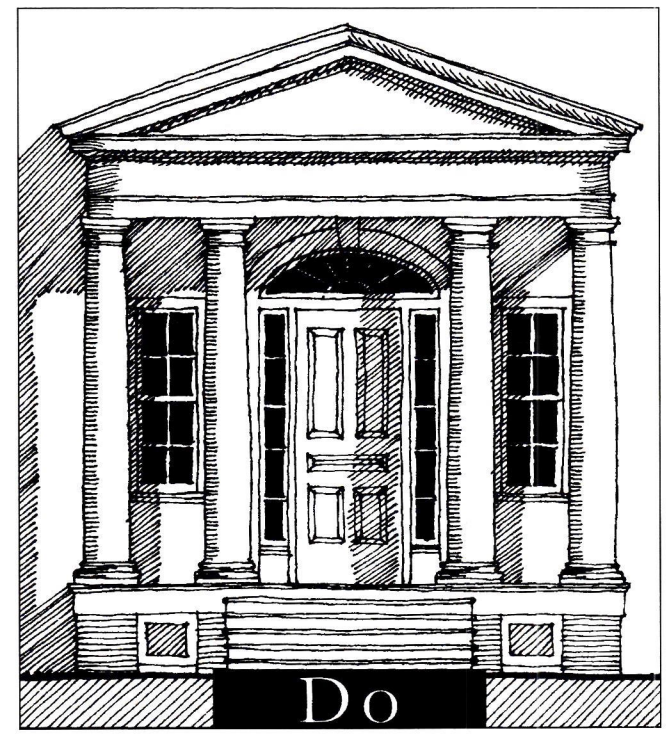
Traditional architecture, whether at the Classical (composed) or vernacular (relaxed) end of the spectrum, almost always places columns and openings in a manner that while sometimes not simply regular, is nonetheless extremely rational.

Many of the patterns of traditional architecture such as this one appear, on the surface, to be based purely on formal aesthetic notions. But often there are underlying utilitarian principles based on efficient use of time or of material or on some other basic need such as comfort or safety. Here, the utilitarian reason for the regular placement of columns is this: If the column spacing varies, the beam that the columns support must be designed for the widest span between columns. It makes little sense to change beam sizes from span to span, so the largest required beam size is often used throughout the entire colonnade. This means that the beam is probably oversized everywhere except at the long span, wasting time, materials and therefore money.

Window openings are not quite so utilitarian. A slight amount of layout time might be saved with a regular arrangement of windows, but the time saved would usually be negligible. The primary reason here for the regularity of door and window openings, which has been seen countless times in both great and humble buildings since the beginning of construction, appears to be humanity's deep need to try to make sense out of the



Don't make the face, or entry, of a building irregular. Modernist buildings usually go to great lengths to bear no resemblance to the human face.



Do reflect the symmetry of the human face at the entry of a building. Entry compositions do not have to specifically look like a human face to be laid out according to some of the same principles, although some buildings do have a door like a mouth and windows above like eyes (not shown here).

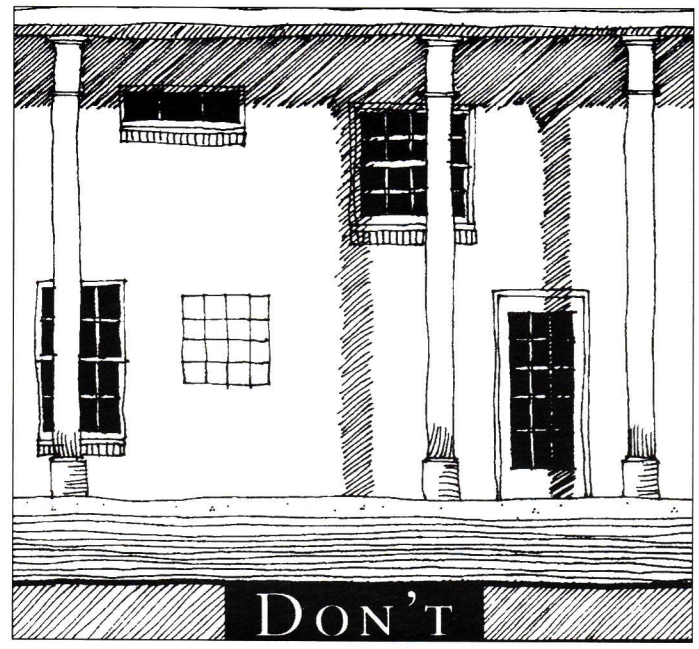
surroundings. Individual humans tend to take disorder in their worlds and try to order it. This explains not only the regularity of window openings, but also why the average person usually turns away from the new styles of architecture that look more like train wrecks than buildings.

Cap, Shaft and Base

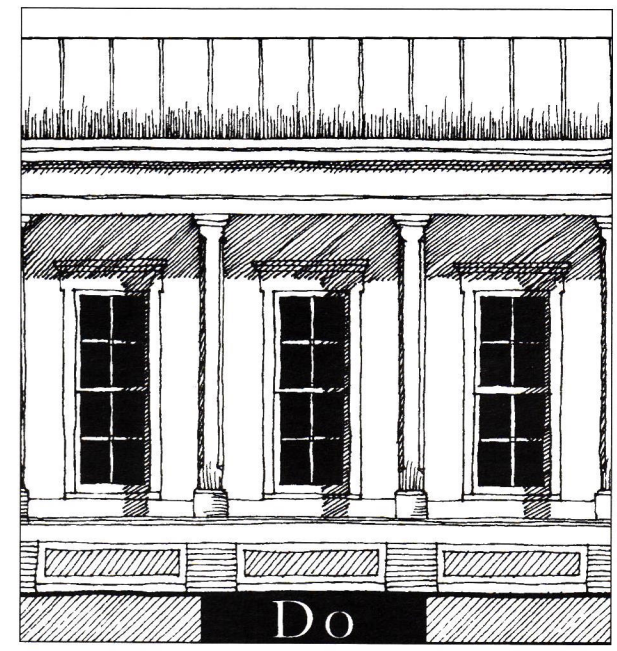
Nearly every element of traditional architecture reflects the head/body/feet (or cap/shaft/base) arrangement of the human body.

The arrangement of the human form is such a clear influence on the shape of traditional buildings that everything from the shape of the entire building to the shapes of the smallest details contains reflections of this pattern. For example, the building is usually composed of a visible roof, wall and foundation. If the roof is not visible, then entablature at the top of the building is usually highly expressed, to create the cap. Within the Classical order, there is the entablature (cap), the body (shaft) and the pedestal (base). Within the entablature, there is the cornice, the frieze and the architrave. Within the cornice, there is the cymatium, the corona and the bed. Within the column, there is the capital, the shaft and the base. Within the capital... you get the picture. Even elements as simple as baseboards contain the base cap, the base and the shoe.

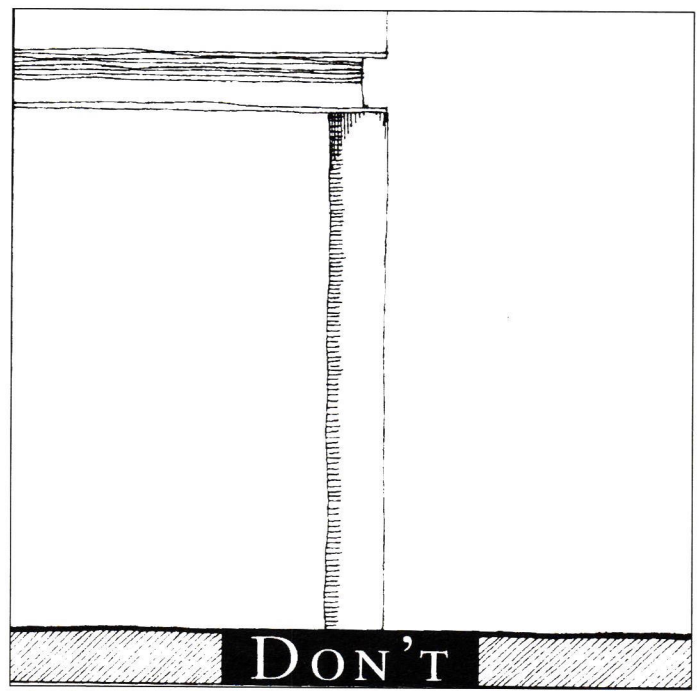
Few patterns have been as powerful for as long as this one has in the entire history of architecture. This pattern descends directly from the theme of architecture for people. It has spawned thousands of patterns, but requires nothing but the human form for support. No architecture except for machine-based architecture has ever opposed it, and its omission has produced three generations of headless and baseless buildings to which most people do not respond.



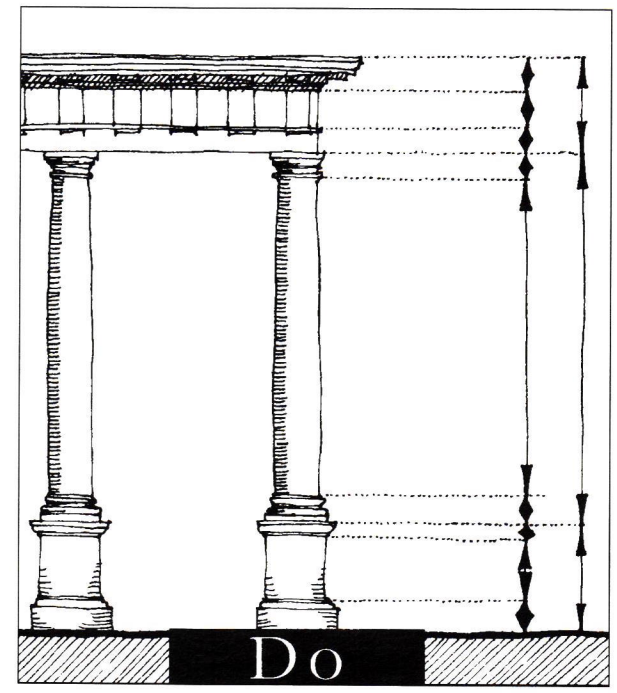
Don't place openings and columns randomly. The "form follows function" dictum has been used for years as an excuse not to compose elevations except according to the basic functional needs of the interior rooms. In all except the most skilled hands, the results usually resemble this.



Do place columns and openings according to a rational system. Openings centered between regularly spaced columns are one obvious strategy, but the important thing is simply to have a system of composing the elevations that is more than the usual randomness.



Don't build decapitated buildings or buildings that are cut off at the knees. Buildings with no head or base bear no resemblance to the human body and usually create places that do not resonate with most people.



Do arrange buildings and their elements to follow the pattern of cap (head), shaft (body) and base (feet). This ordering of cap, shaft and base has resonated with humanity since the dawn of time.

Site Arrangement

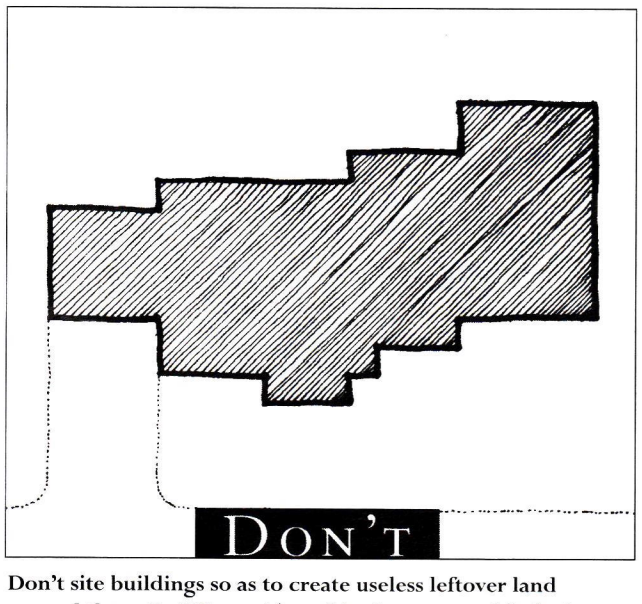
Most traditional architecture is arranged on the site to create either internal courtyard spaces or external street spaces. Only the noblest Classical buildings should sit back on the center of their lots by virtue of their importance in the community.

This pattern makes sense in several ways, and that is why it has existed almost since the dawn of civilization. It also deals with the heart of the nature of the city, which is to create the most public and the most private places next to each other. The primary spaces of the city include the square, plaza or park; the street; and the private courtyard.

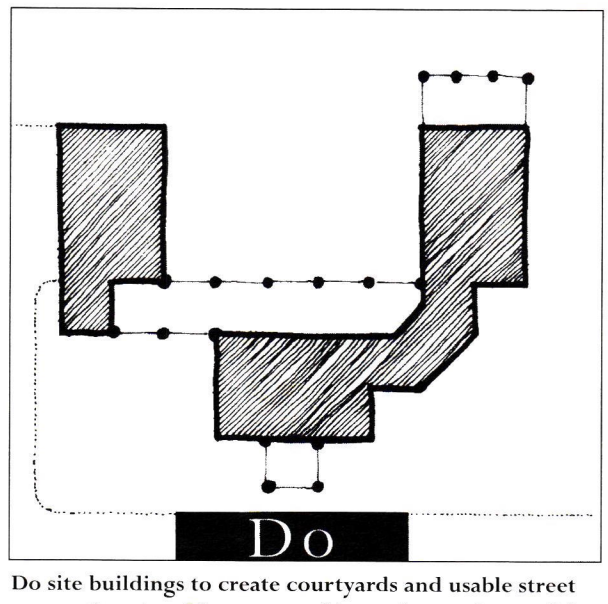
Civic buildings are placed either around a public square or at the center of a public square for a number of reasons. First, it makes them more prominent according to their function within the community. Second, placing a building a distance from the street allows more people to see it at once and for a longer time as they pass by. Both aspects are appropriate for important buildings. Finally, placement on a square or in a square provides a convenient place for people to congregate before, during or after functions at the civic building.

Most of the fabric of cities, however, was traditionally built not on squares, but rather on streets. Streets were the usual condition; and plazas, squares and parks were the special conditions. To function properly as a public room and not just as a corridor for cars, streets must have a wall on either side that is tall enough to make the street feel as an enclosed room does. The primary civic responsibility of non-civic buildings, therefore, is to pull up as close, as tight and as tall to the street as is appropriate to their location in the city. On a main street, they should stand shoulder to shoulder and pull right up to the sidewalk, whereas in lower-density, primarily residential areas, they can obviously be set back and separate themselves by yards.

The enclosure of space on private land has almost become a lost art. Once, people would not have considered building a house without a partially enclosed courtyard or garden somewhere in the design to provide private outdoor space. Even in the country, the American farmyard followed this same pattern, with outbuildings or dependencies forming a ring around a rear yard. ■



Don't site buildings so as to create useless leftover land around them. Buildings plopped in the center of their site combined with a front-facing garage is a recipe for a very ordinary street with no appeal. When the street has no appeal, the buildings must spend thousands to have street appeal.



Do site buildings to create courtyards and usable street spaces. Courtyard houses provide outdoor privacy of the highest order. Rear lanes, if they are available, provide access to the garage that leaves the streets free to be beautiful. If lanes or alleys are unavailable, a single-lane driveway to a garage (ideally side-facing as illustrated here) set far back on the lot does far less damage to the beauty of the street than a double-wide driveway.

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Avoiding Fenestration Fiascos

The placement and selection of windows can make or break a house.

By Christine G. H. Franck, Institute of Classical Architecture & Classical America

While there are many issues of good design that affect the cost of a building, placing and selecting well designed windows does not. One of the most easily remedied problems in houses designed today is window placement and selection. This article explores five of the most common errors that I have found in fenestration. For each error, I offer guidelines for creating better designed houses. The scope of this article does not include the many important aspects of window design and performance such as details, design pressures, energy ratings or materials, which do affect the cost of a window; a designer should always select the best performing and constructed window within his or her budget. The following guidelines can generally be applied at any price point, but it should be remembered that these are only guidelines meant to establish general rules, which, of course may be broken by those talented enough to do so.

The Dependency Building at the Shirley Plantation in Virginia has a five-bay window composition with 6 over 6 and 9 over 9 windows.

Error #1 – The "Here a Window, There a Window" Approach

After the basic wall and roof layout of a building is designed, one determines the placement of the window openings. This is the first place where errors are commonly made that negatively impact the overall design of today's houses.

A quick drive down any suburban street will reveal houses with windows that are crammed too close to the corners, not aligned with one another, deployed higgledy piggledy across the façade or have no relationship to any other window on the façade as they are related only to the plan of the house. Instead of this unfortunate visual chaos that assaults us everyday, a successful façade should have windows placed in a manner that reinforces, rather than competes with, the design intent of the building.

To do so, windows should be placed such that a balanced composition is achieved. This could be thought of as the "just right" factor. Some houses are simple rectangular forms with a gable or hipped roof and are bilaterally symmetrical such as a Georgian- or Federal-style house. Other houses are asymmetrical and composed of many discrete masses under different roof forms, such as in a Victorian or Spanish Revival house. In both of these circumstances, the windows should be placed to establish a rhythm of openings across the façade and to balance the solid parts of the façade with the open parts.

The Westover Plantation in Virginia has a seven-bay window composition with 9 over 9 windows.

In those compositions that are bilaterally symmetrical, windows should be placed one above the other and spread across the façade establishing a three-, five- or seven-bay structure. Though more may be possible, it would not generally be desirable to have more than seven bays within the central block of the house as the house will appear too long. The spacing of each of these bays can be equal or it can be compressed or expanded in places to produce a rhythm, but the bays should be the same about the centerline of the building. Side elevations should also have an underlying bay structure that sits where the windows are to be placed. The side elevations, because they are not as important as the front elevations, can accommodate some slight inconsistencies if necessary.

The spacing between these windows should not be less than the width of the window itself, since shutters would be impossible. Nor should it generally be wider than one and one half times the window's width, otherwise there will appear to be too much wall and not enough window space. If it is desired to space windows very close together, then they can be joined with mullions to create a wider window, such as the tripartite windows of Greek Revival-style houses.

Many houses, though, are not a simple box. In the case of Victorian- and Spanish Revival-style houses, to name two compound massing types, the strategy for placing windows is different than the bilateral condition described above. Rather than establish a bay structure that runs across the entire façade, windows are placed such that they create a regular rhythm of openings, where possible, with additional openings being placed in the center of any discrete masses of the building, such as a gable end, which then balances the entire composition.

In asymmetrical compositions, balance is achieved by accenting solid, heavy parts of the composition, such as end gable walls, with small windows of interesting shapes, whereas long stretches of wall running parallel to the ridge beam should have windows spaced regularly across the expanse of the wall. It is generally true that in buildings that are consistent with romantic revival styles, particularly those having a Medieval influence, there will tend to be smaller windows more widely spaced that appear to puncture the façade.

Generally, a traditional house will not have windows placed such that they contradict or infringe upon the apparent or actual structure of the building. Windows should not be placed closer to the corner of a building than their width, as doing so will appear to weaken the solidity of the corner of the building. There are exceptions to this, such as found in Lutyens'

This Victorian house in the Midwest has an asymmetrical window composition with 9 over 1 windows. Note how the three square windows are gathered under the gable end to create the appearance of one horizontal window.

An asymmetrical window composition with decorative grilles was also used on this Spanish Revival house in Coral Gables, FL. Note how small the window openings are in relation to the overall wall surface.

or Wright's work, or Arts and Crafts-style houses. If one is to infringe upon the corner, careful study of good precedent is recommended.

Window heads should align across the façade at each floor such that a visible line of structure is established and can be a generative force in locating windows. For example, if an arch is employed within such a line of windows, one should align the spring line of the arch with the head height of the rectangular windows as these both represent a similar line of structural transition. Setting and maintaining a consistent line of structure is one of the ways that windows can be coordinated in an asymmetrical building while other things, such as porches and turrets, create interesting forms.

Vertical location is important as well, and one should take care not to locate windows in a manner that interrupts any horizontal lines of structure such as a cornice, stringcourse, water table or base, as this, too, will appear to contradict the firmness of the building's construction. Just because something can be done does not mean that it should be done.

Error #2 – Any Style Will Do, Just Pick One

Establishing a structure for the placement of windows is only the first step; after that one must consider what type of windows will be used. A designer would be wise to remember that a house's façade is not a palate for showing off every style in a window catalog. Rather, creating a building with character requires all parts, even the windows, to be harmonious with each other.

It may seem obvious, though observation shows me it is not, that the style of a window should be consistent with the style of a building. For example, broadly proportioned windows with heavy muntins and small lites feel appropriate for a somber Georgian façade, whereas vertically proportioned windows with large lites and knife-thin muntins feel well suited to a delicate attenuated Federal-style building, and so on through to the windows slicing through the corner of a Frank Lloyd Wright house; each window adds to and balances the overall composition and spirit of each façade.

One should select the type of window, its materials, its number of lites and its muntin profiles depending on the intent of the design of the house, for these are all part of the refinements of the design of a house.

Generally, earlier Colonial-style houses tend to use wooden-sash double-hung windows with paneled, louvered or plank shutters. Later house styles, such as those romantic revival styles like Spanish Revival and Mediterranean, tend to use metal casement windows with wood-plank shutters or without any shutters at all, but with features not seen in Colonial houses, such as protective metal grilles or turned wooden spindles forming a screen, or *reja*, within the open space of the window. As with all design, the best way to gain knowledge of what will be right for your design is the careful examination of good examples and application of their lessons to your work.

Error #3 – The More Shapes, The Merrier

After selecting the general style of window to be used, one must select the actual size and shape of the window. Windows should have a consistent size and shape throughout the building, with special window shapes being preserved for special locations, such as an elliptical window above the front door, for example.

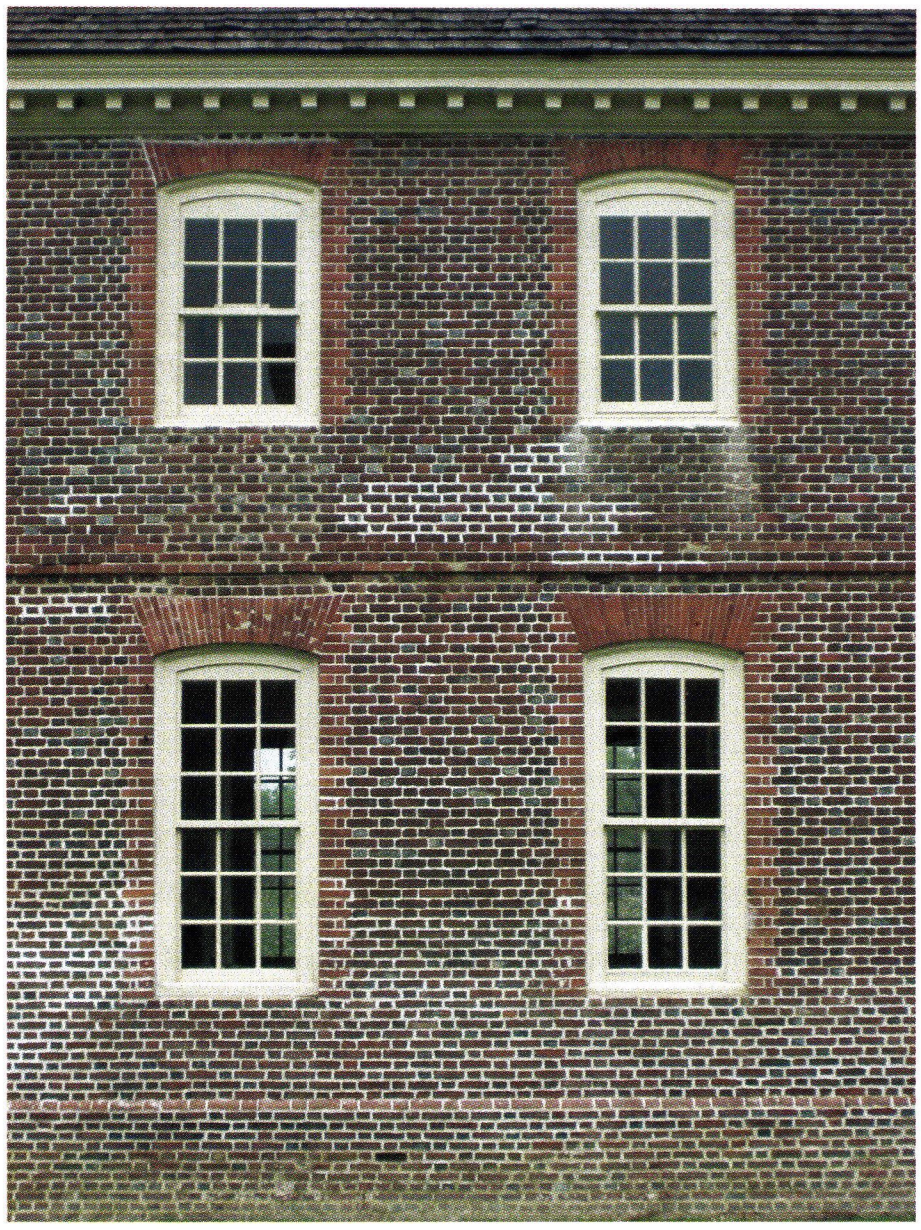
Windows should be neither too wide nor too narrow, and while one might, in some instances, employ square or horizontal windows, windows should generally be vertical in orientation. This relates to the human form and the way that we experience the world from inside a building.

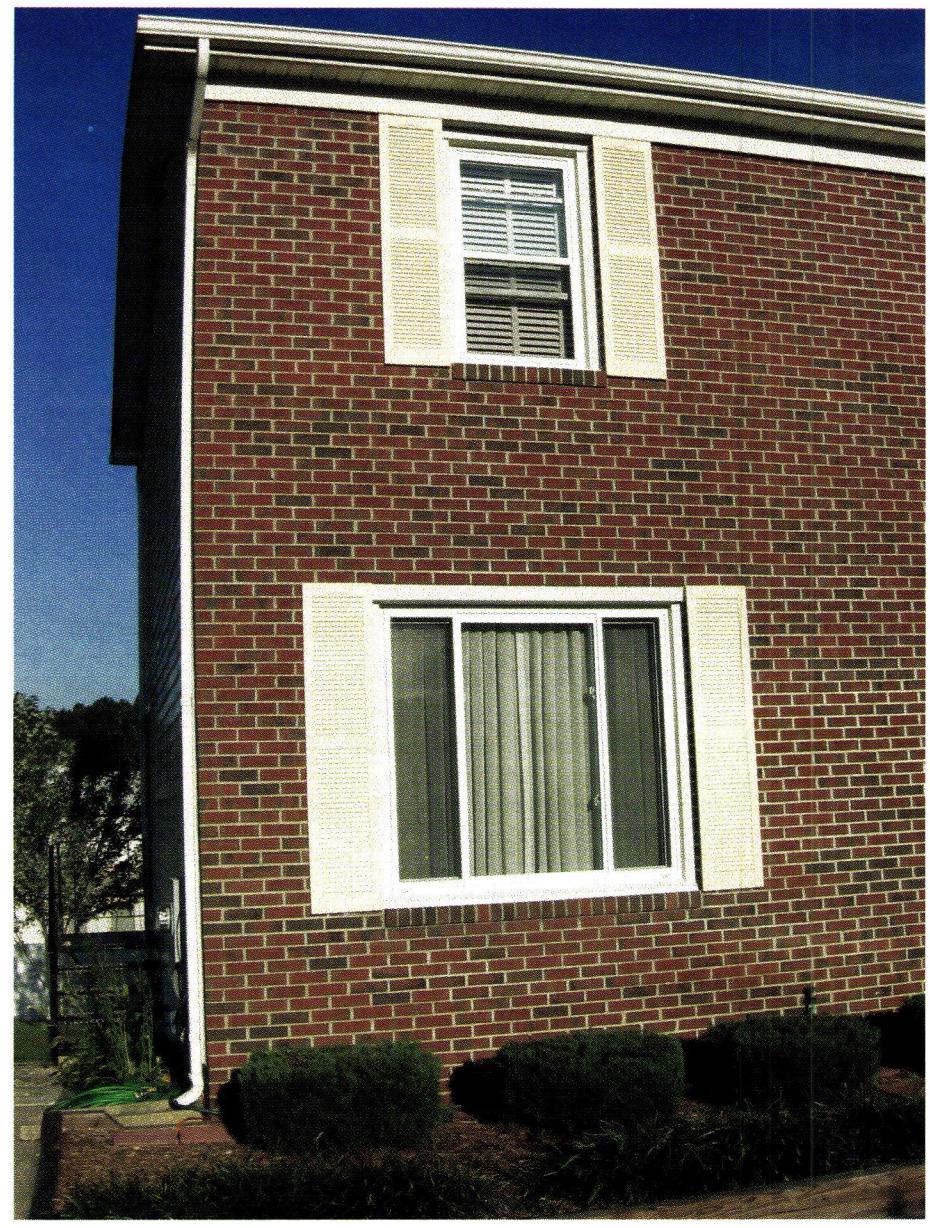
Window sizes and shapes in a building will not be all the same, though they should be related to one another, as if they were all first cousins in the same family. For example, one would not want to combine pointed-arched Gothic windows with rounded-arched windows in the same building, as these two different arch types have very different visual effects that do not reinforce each other.

The primary size variation will occur between stories, as the upper story windows are often smaller than those below. This produces a pleasing visual effect from the exterior, as windows get smaller as they rise and

This modern tract house has windows of various shapes and sizes. Note how the windows look like toothless gaps since they lack a tertiary division with muntins, and how oversized the segmental arched window above the front door appears in relation to the width of the wall where it is located.

This modern house has an overscaled central window. Note how it overwhelms all other aspects of the façade design.





These details of windows at the Dependency Building (left) and the modern tract house window (right) show how important it is that the window opening be divided down into sashes and lites, such as it is to the left, if the window is to establish scale in the design. Note too how the lower window to the right has shutters that can never be used as they would not cover the width of the opening.

thus accentuate the apparent height of the building. It also expresses the interior function of the plan, as these smaller upper level windows typically occur on floors where the functions are more private, such as bedrooms, and where the floor to ceiling space is less. This dimensional decrease can occur by reducing the window height by one or two lites, or one can maintain the same number of lites and the same proportion of both the lites and window opening, while reducing the size of the opening and the lites.

A perusal of just about any company's window catalog will reveal the most astonishing shapes, most of which one never need use. Many of the shapes or lite divisions (often called grille patterns) are simply irrational – too wide, too thin, shapes that one cannot imagine being made, even if they can. One should not use irrational shapes or patterns, as they do not contribute to a design that is grounded in the gravitational reality through which we understand the world. Many of these irrational and bizarre shapes seem to come from a desire, if window manufacturers' literature is to be believed, to give the designer the most possible options. Sometimes, though, it is better to consider fewer possibilities by considering better ones. A façade with a multitude of window shapes is horribly chaotic, confusing and leaves the eye no place to rest. Stick with basic shapes. Rectangles and arches, pointed or round, will do for most houses.

Error #4 – Dividing the Window

Once one has established a scheme for locating windows on the façade, selected a window style and overall size and shape, the next step is the division of that window into sashes or leaves and lites. Much in the way that window location and shape should reinforce the overall façade composition, so too should the secondary and tertiary divisions of a window reinforce the overall window design. This step of breaking down the large expanse of a window into smaller pieces helps to establish the scale of a building, and brings the details of a building into our human scale. Though there is always variety, a look at the divisions of a few different window styles will help to illustrate how much variation there is in window design and how different styles are from one another.

In most Colonial styles, one finds double-hung wooden-sash windows with broader proportions, wide muntins about 1⅛ in. wide with a quarter-round profile on either side of a fillet, or what is commonly referred to today as an ovolo-shaped muntin and 6, 9 or 12 small lites per sash depending upon

These three windows from St. Augustine, FL, show different uses of protective shutters and a protective wooden screen (far right).

It is not uncommon to link windows together to create a wider expanse of window, such as the windows shown at left and below from Palm Beach. However, today, one often finds that a large expanse of window is achieved in a manner that overwhelms the building, such as in the example above. In this case, the important secondary divisions of mullions are missing in the large arched window to the left of the door, leaving this house looking like it is about to fall apart.

the size of the window. In Federal and Greek Revival styles, the window opening expands to a more vertical proportion and is divided into fewer pieces with larger expanses of glass. One finds double- or triple-hung wooden-sash windows with proportions of 1:2, 1:2½ or up to 1:3, normally with 6 lites per sash and beveled muntins in the range of $^{7}/_{8}$ in. to $^{5}/_{8}$ in. wide.

Victorian-style houses extended this double- and triple-hung trend of tall proportioned windows with a fewer number of lites, such that the windows of flamboyant Victorian houses often have two to four lites per sash, which does produce the odd condition of having muntin right in front of one's eyes when one stands in the middle of the window. Nonetheless, this fewer number of lites in each sash provides a quiet balance to the busyness of a Victorian façade. In some cases of Victorian styles, and in Bungalow styles, it is common for only the upper sash to be divided into lites.

The many romantic revival styles in America, such as Spanish Revival, English Tudor and French Norman, often employ a mix of window types, including metal casement windows and leaded-glass windows with small diamond-shaped panes. One can imagine that a tall expanse of window, like one might find in a Federal house, would look out of place in a thick adobe-walled Spanish Revival house designed to keep the sun out in a hot climate.

The list of characteristics of different window styles and their compatibility with different building styles could be an article in itself, but, so long as one remembers that one should select a style of window appropriate to the style of the building, then the overall resulting design will be a good one. It is good to always recall that one should consider first the strategy of placement of windows, then the overall proportion of the window, next the division of that window into sashes or leaves, then the division of those sashes or leaves into lites and lastly how those lites are held together such that the muntin profile, if any, is the last decision in the design.

It seems amazing that something as small as a muntin can affect the appearance of a house, but muntins establish a sense of scale for the building and one can see how much it does when one considers the all-too-common errors of either using no muntins to subdivide a sash or placing muntins between the glass of a window. This incomprehensible strategy to window design, muntins between the glass, means that the muntin casts no shadow and thus the division of the sash into lites cannot be seen at all.

Error #5 – Window Openings Don't Matter

Lastly, each window sits in a wall, and thus the final aspect of window design rests in how the opening itself is finished. One can alter the appearance of a window and significantly alter the overall façade design with the manner in which a window opening is trimmed out. Far too often, window surrounds are made too narrow relative to the width of the window opening, or keystones are too small and look as if they will slip out of place, or lintels are made too thin and long so they appear brittle or bricks are laid in a running bond across a steel lintel rather than creating a jack arch, whether one is needed or not. These are very typical errors in making the window opening, and it must be pointed out that trimming out the window can become a cost issue, but this is an area where it would be wise to allocate money from a project's budget.

In Classical styles, such as Colonial, Federal or Greek Revival, one can use a general rule of thumb by making the exterior window casing equal to $^{1}/_{6}$ of the width of the opening, such that on a 3-ft.-wide window, the window trim would be 6 in. wide.

Likewise, in many of the romantic revival styles, one will find window openings treated with no trim at all, or with small colonnettes used at either side or between mulled units, with round or pointed arches used above the window.

Again, the best way to learn is careful study of good examples.

Windows are the eyes into the soul of a building; each aspect of the design of windows is critical to creating a beautiful, harmonious building. From establishing a clear scheme for their location, to selecting the appropriate style of window for your house, to sizing the window properly and selecting the best shapes for your design, all the way down to how the window is broken down into its smallest parts and, of course, the surrounds that frame all of this – each of these aspects of window design is essential. There are many historic variations, but not perhaps as many as today's window catalogs might have you believe. Recall, always, that less is more, and strive for restraint and stylistic compatibility between the house and the windows when placing and selecting windows and you will achieve more beautifully designed houses. ■

Eclectic Masterpiece

Diverse influences abound in a new residence in Wisconsin.

PROJECT: RESIDENCE, SOUTHERN WISCONSIN

ARCHITECT: THOMAS GORDON SMITH, ARCHITECTS, SOUTH BEND, IN; THOMAS GORDON SMITH, PRINCIPAL

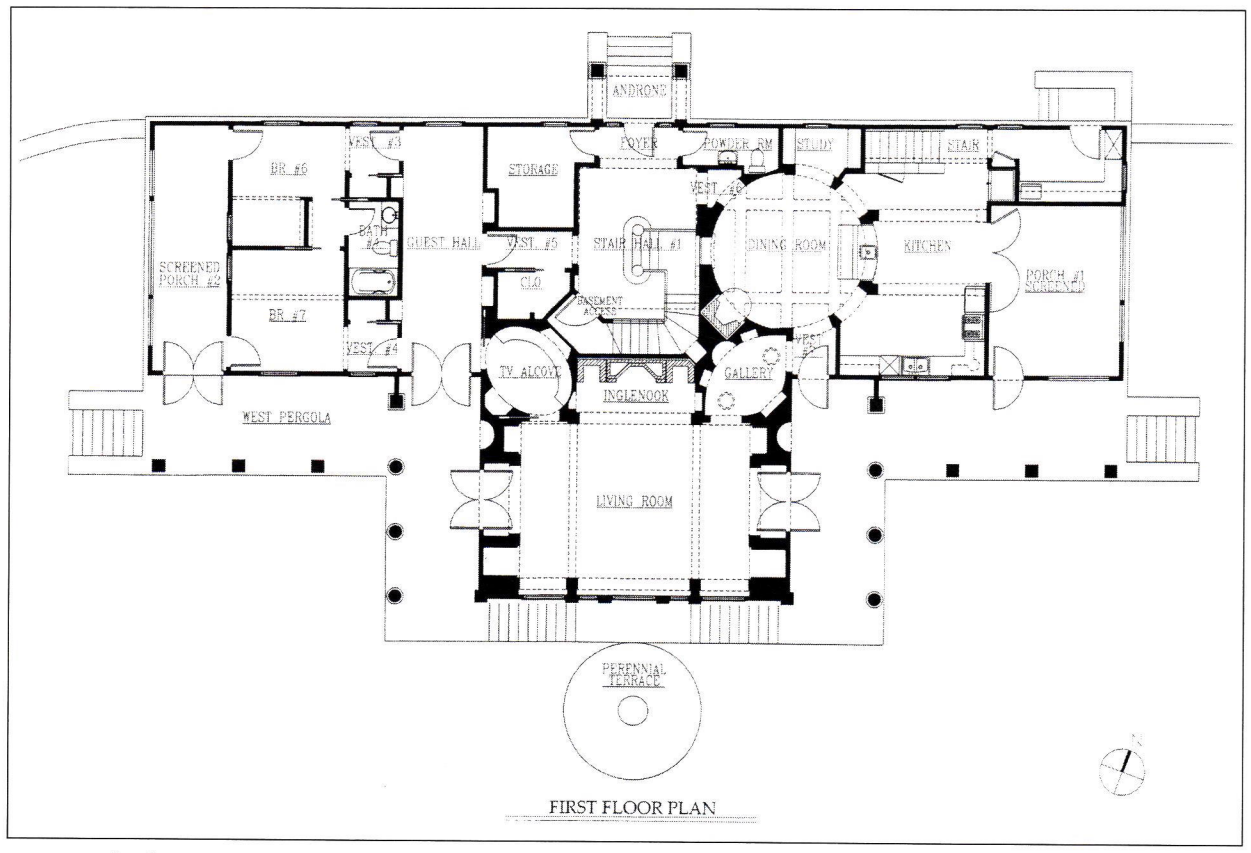
GENERAL CONTRACTOR: RADEL CONSTRUCTION, SOUTHERN WISCONSIN; RON RADEL, OWNER

Who would think that one home could combine influences from such diverse sources as the watercolors of Carl Larsson, late-18th- and early-19th-century Dutch-American farmhouses, Frank Lloyd Wright details and the massing of a Palladian villa? These eclectic inspirations were brought together by Thomas Gordon Smith, principal of Thomas Gordon Smith, Architects, of South Bend, IN, in the design for a residence in rural Wisconsin.

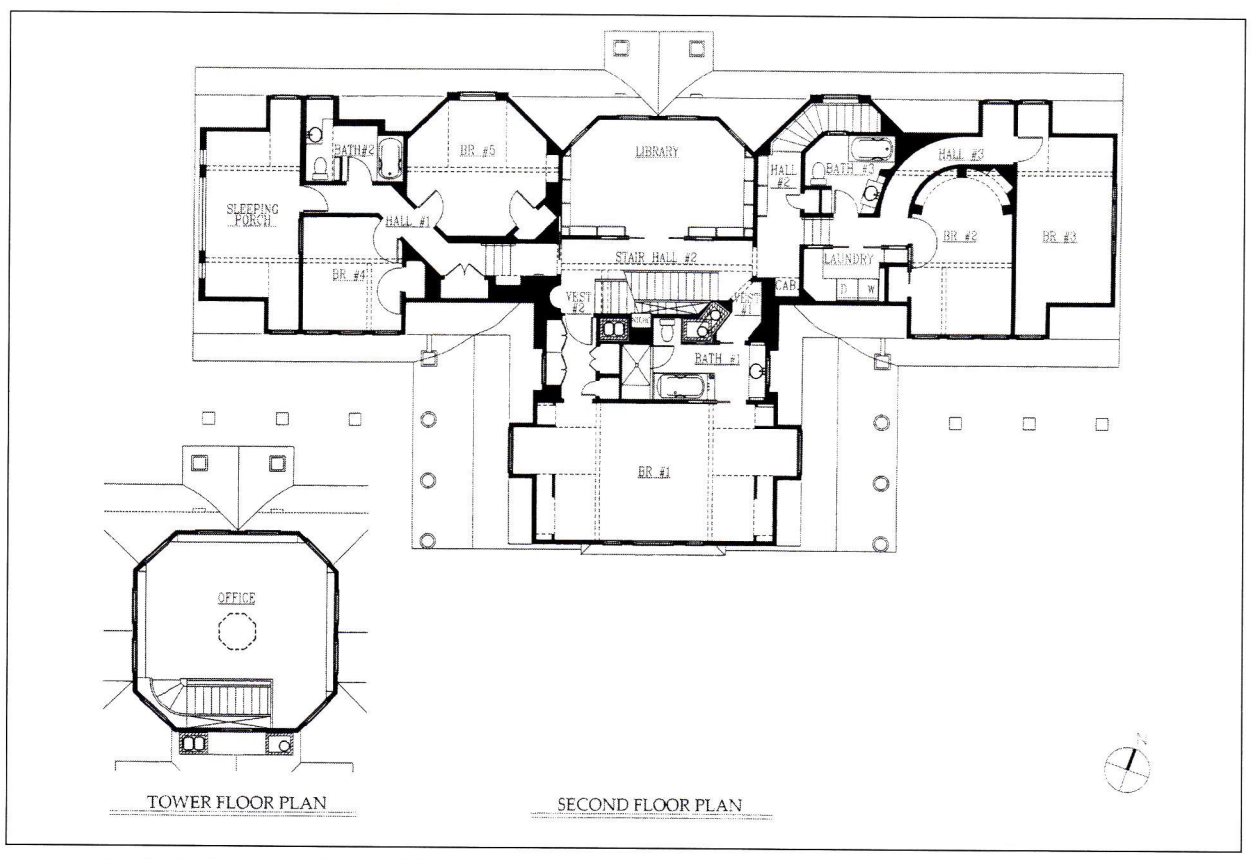
The 8,000-sq.ft. home features seven bedrooms, a circular dining room, two screened porches and an octagonal tower. A garage, gambrel roofed in reference to the main house, a tennis court, pool and pool house are located an eighth of a mile to the east of the

This weekend retreat in Southern Wisconsin, designed by Thomas Gordon Smith of South Bend, IN, is sited on the edge of a prairie valley surrounded by lush hills. *All photos: Alan McIntyre Smith*

The home balances symmetry with asymmetry, uses a number of diverse materials and puts great emphasis on color and massing. The exterior coloration is inspired by red and ochre farm buildings in the region.



The first-floor plan is asymmetrical and features a wide variety of room shapes. The rooms in the east wing are public, including a foyer, the central block has a living room and dining room, while the west wing houses guest quarters.



A principal bedroom is one of five located on the second floor. The two guest bedrooms on the first floor bring the number to seven. Also of note on the upper floor is a principal bathroom, two smaller full baths, a library and a sleeping porch to the west.

The plan is non-linear within a symmetrical "T" shape. A massive fireplace chimney blocks the north-south axis between the otherwise symmetrical foyer and living room. This volume is covered by a broad gambrel roof surmounted by an octagonal tower housing an office. The east-west axis accommodates an array of variously sized and shaped rooms, from screened porches at each end to the circular dining room and elliptical alcove and gallery.

The complex layout of the second story clearly reflects Smith's play with geometry. Aside from a principal bedroom above (and about the same size as) the living room, there are four smaller bedrooms, three full baths and a library. Smith designed the rooms as if "putting together a puzzle. The clients specified a large number of rooms, but didn't want them to be uniform," he explains. Each bedroom was given a different character – the shapes, paint colors, furnishings and upholstery vary from one to another. One room is octagonal and one has a half-circular end. Irregularly shaped halls reinforce this plan. "This was the practical option," Smith says. "But it's also fun to explore." This sense of exploration stems from Smith's interest in the Baroque, particularly in Borromini and Guarini and in their revival through the work of Kilian Ignaz Dientzenhofer.

Inspired by Palladio's Villa Barbaro, Smith designed a central block dominated by a gambrel gable and a wing on either side. This T-shape form is pushed toward the northern edge of the privately owned valley. The gambrel roof mirrors the shape of the hills while, Smith points out, "the vibrant red and ochre-painted shingles provide contrast to the dark green landscape of midsummer." These primary exterior colors reflect the barns in this region, though they had never before been combined on one structure.

The low, broad gambrel was an element borrowed from Dutch-American farmhouse roofs of the Hudson River Valley in New York and in New Jersey. Smith made numerous visits to 18th-century houses to study the precedents and was also able to review drawings of structures that no longer exist. The roof was the design solution to minimizing the size of the Wisconsin home. "The house appears small," says Smith. "Even up close, it is not overwhelming."

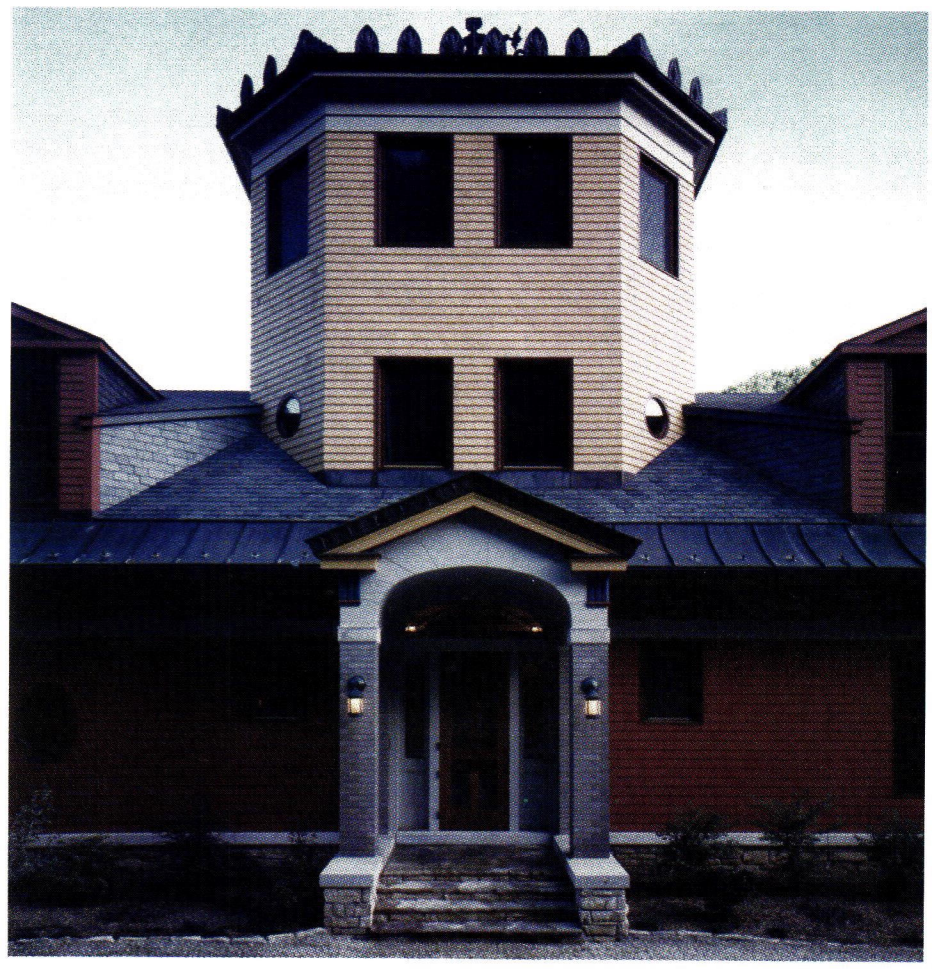
When the clients bought the property, they wanted a wooden rustic structure, but were also interested in using stone in some way. Smith was able to utilize both materials.

house. The exterior materials used on the house are as diverse as its inspirations: cut and carved stone, cedar shingles, brick, cast metal and sheetmetal.

The project was a weekend retreat from Chicago. The goal was to emulate the character of a generations-old family gathering spot in Massachusetts and to continue the tradition for a branch of the family in Chicago. The clients specified that the house should not look too big, but also that it should have enough rooms to accommodate present and future family members and guests as well as many different activities. A major challenge for Smith was to provide the bedrooms, each with a distinct character, without blowing out the massing of the house. Guest bedrooms also had to provide privacy from family bedrooms in an out-of-the-way suite.

Smith began the design of the house in 1998. The owners were particular about the size and materials, while Smith employed his own interests in Classical and Dutch-American design, geometric shapes and the colors that define its character.

The house is sited dramatically: "We needed to avoid the path of multiple water channels," says Smith. "The location we chose ended up solving that issue and at the same time providing us with many rewards." The landscape, a prairie valley surrounded by lush hills, provides spectacular views – the house is oriented to take the best advantage of these and of solar benefits and air circulation.



An octagonal tower, crowned by pressed-metal antefixes and a bronze triton weathervane at the apex, is at the center of the north elevation. A library and office are located in the tower on the second and third floors respectively. Pressed copper ornament, rain water conductor heads and the palmettes on the octagonal tower are from Nevada, MO-based W.F. Norman Company.

The Patina of Age

A philosophy of respect guided the conservation of Greene & Greene's Gamble House.

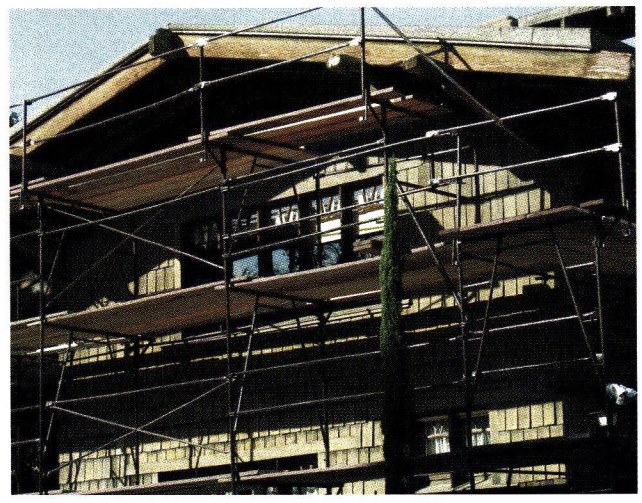
PROJECT: GAMBLE HOUSE, PASADENA, CA

ARCHITECT: KELLY SUTHERLIN MCLEOD ARCHITECTURE INC., LONG BEACH, CA; KELLY SUTHERLIN MCLEOD, AIA, PROJECT ARCHITECT

RESTORATION CONSULTANT: HISTORIC RESOURCES GROUP, HOLLYWOOD, CA; PEYTON HALL, AIA, PRINCIPAL

CONSERVATOR: GRISWOLD CONSERVATION ASSOCIATES, BEVERLY HILLS, CA; JOHN GRISWOLD, PRINCIPAL

GENERAL CONTRACTOR: VOSS INDUSTRIES, INC., PASADENA, CA; JEFF VOSS, PRESIDENT



The exterior of Greene & Greene's 1908 Gamble House in Pasadena, CA, was conserved in 2003. Conservators repaired timber beams, rafter tails and shakes that were seriously deteriorated after decades of exposure to the natural elements. Window screens were also restored and the leaky roof was replaced. *All photos: The Gamble House*

Left: The Gamble House remained open for tours during the conservation project, so the team painted the scaffolding, as well as the security fence and office trailer, a custom chocolate brown so that it would blend in with the house and its surroundings.

The conservation of Greene & Greene's famed Gamble House in Pasadena, CA, was concerned mainly with exterior wood elements. More than a dozen wood species, including oak, redwood, Douglas fir, teak and cedar were formed into the building's timber beams, rafter tails, wall shakes and some interior elements. After decades of exposure to weathering, though, much of the exterior woodwork had deteriorated. Previous repairs using impermeable epoxy putty also compounded the damage to the rafter tails, outriggers and beam ends of the National Historic Landmark building.

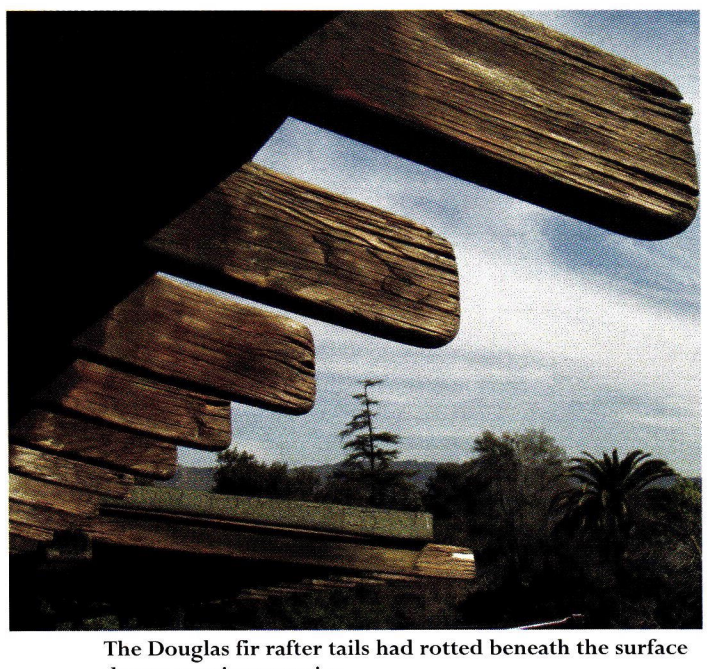
Built in 1908 and 1909, the 8,100-sq.ft. house was, in many ways, the apotheosis of Greene & Greene's design sensibility. This sensibility emphasized detail and handmade, custom-crafted elements. Greene & Greene designed every aspect of the house, including the furnishings, light fixtures, windows and landscaping. Local craftspeople fabricated furniture, wood carvings, leaded and stained glass and other elements.

Fortunately, all of the interior treasures have survived. By the 1990s, however, the exterior of the house required extensive repair and conservation. The owners – the City of Pasadena and the University of Southern California – believed it was imperative to conserve the Gamble House and embarked on fundraising, grant writing and assembling a restoration team.

In 2000, Historic Resources Group (HRG) of Hollywood, CA, completed a Historic Structure Report and developed a conservation plan. The 600-page assessment became the guiding document for the subsequent conservation of the exterior.

HRG, along with restoration architect Kelly Sutherlin McLeod Architecture Inc., Long Beach, CA, and conservator Griswold Conservation Associates, Beverly Hills, CA, subscribed to a philosophy that the house should receive all necessary repairs without taking on the appearance of new construction. This was adopted from the Secretary of the Interior's Standards for Historic Properties and from the Code of Ethics and Guidelines for Practice of the American Institute for the Conservation of Historic and Artistic Works. All agreed that "the exterior needed to resonate with the Greene's original design vision," McLeod says.

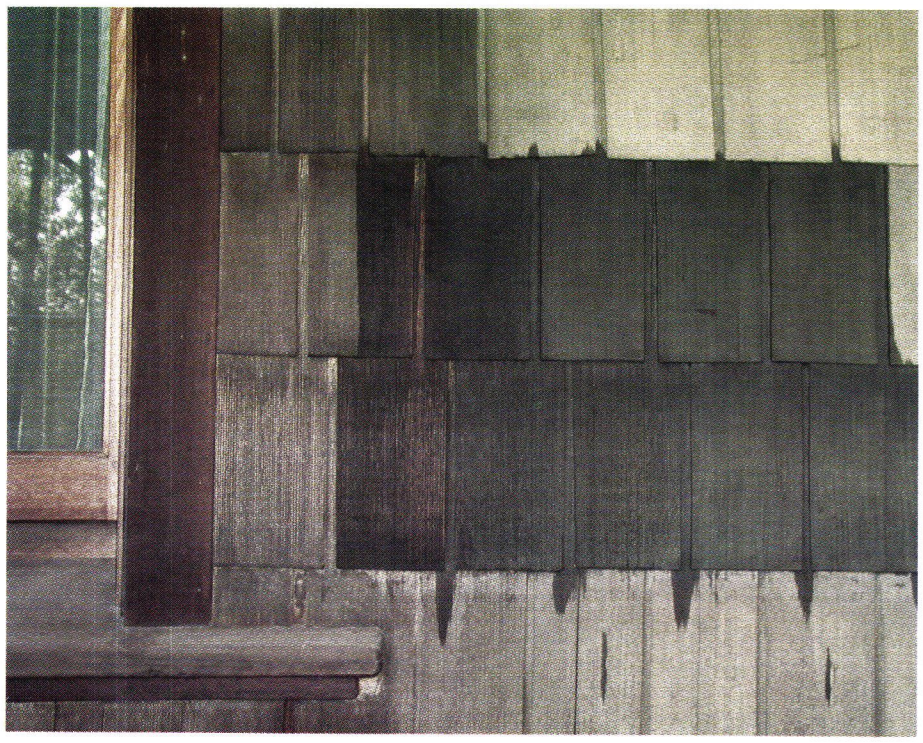
In October 2003, scaffolding was erected, allowing the architects and contractor access to the beams and rafter tails. As all of the work concentrated on the exterior of the house, barring minor electrical work, the Gamble House remained open for tours. Because of this, the scaffolding, security fence and office trailer were painted a custom chocolate brown so that they would blend in with the house and its surroundings.



The Douglas fir rafter tails had rotted beneath the surface due to previous repairs.

Left: After the old patching material was removed, the fragmented wood of the rafter tails was treated with various consistencies of fungicide and Abatron's LiquidWood epoxy consolidant.

Below: To obtain the appearance of Douglas fir, original grain patterns were simulated. As the wood ages, the patches will split and form end-grain checking.



This area was used to test potential sealants for the split redwood shakes.

Several layers of Amteco TWP 500 consolidant were applied to saturate the color of a new paint job after the shakes were individually cleaned.

More than 250 Douglas fir rafter tails and beam ends required attention due to rot beneath the surface. "The old patching material had formed an impenetrable barrier at the surface of the wood, preventing moisture from escaping," says John Griswold, principal of Griswold Conservation Associates. Dental tools and other hand-held instruments were used to remove the old material and the fragmented wood was treated with various consistencies of fungicide and Abatron's LiquidWood epoxy consolidant. "In the case of severe deterioration or where structural integrity was compromised, we replaced missing wood with Abatron's WoodEpox," Griswold says. "The lightweight epoxy putty was engineered to have closely compatible properties with the wood, such as thermal expansion and moisture permeability." Physical properties were also mimicked. To obtain the appearance of the Douglas fir, original grain patterns were simulated. As the wood ages, the epoxy patches will split and form end-grain checking similarly. "Each patch ended up being almost a portrait of the wood that was lost," says Griswold.

All of the woodwork, including the rafters and beams, was finished with Amteco TWP-500 series penetrating sealer, an alkyd-modified long oil with UV stabilizers. Griswold explains, "Experts at the Forest Products Laboratory of the National Parks Service recommended this product, which we tested along with other possible consolidants for the redwood wall shakes. We found it to be very good for the other wood elements, as well."

The 36-in. split redwood shakes were found in varying degrees of deterioration. "Thirteen different conditions were identified," says Edward Bosley, director of the Gamble House, "from diseased bare wood to sound material with perfectly bonded paint." Though 70-year-old lead-based degraded paint covered the shakes, research and testing indicated that stripping the paint "would result in the loss of surface detail of the split-grain texture," Griswold says. "As it turns out, the 1930s paint color was not too far from the color of pigment suspended in the original creosote stain, so we developed a strategy to preserve the paint while returning the dark-greenish color of the shakes." The 1930s painting had been directed by the last family resident of the house, most likely due to soiled and degraded shakes that had turned darker, according to historic photographs. Several layers of TWP 500 consolidant were used to saturate the color of the new paint job after the shakes were individually cleaned.

Another issue in the treatment of the shakes and the remainder of the house was that the consultants and architects wanted to preserve as much of the original historic fabric of the house as possible and to retain its patina of age. "We did not want to restore the house to its original 1908 appearance," Griswold says. "This would have resulted in a loss of authenticity." McLeod adds, "In determining what the house would look like after 95 years without repairs and in good condition, we had to factor in the age of the house, the nature of the materials, original colors and textures, aging and weathering patterns, while honoring the Greene's original design intent." In keeping with this philosophy and to preserve historic evidence, only about 28 seriously damaged shakes were replaced with nearly identical salvaged vintage shakes; some of the more hidden shakes weren't even treated. Similarly, scratches, holes and marks that could allow moisture to escape were intentionally made on the new rafter tails and beams.

The leaky roof was replaced to ensure protection of the interior. Approximately the fourth generation of roofing applied to the house, it had begun to fail and look objectionable soon after installation. "The asphalt bed holding the granules had cracked and slumped in the heat," Griswold explains. No original roofing scraps were uncovered, but early records stated that the 1908 roof was a Malthoid roof, a rolled membrane with adhered granules. To replicate this, modified bituminous built-up composition roofing was used. "A roofing material was selected that closely represented the color and texture of that originally selected by the Greenes – a material no longer available and one that failed within the first 10 years after installation," McLeod says. "The challenge was that the modern material, although technically superior, didn't naturally roll around the eave. To achieve the desired effect, the roofing material was loosely wrapped without solidly adhering it around the eave in order to prevent further damage to the historic substructure inflicted by previous roofing campaigns." To restore the roof profile to its original look, a large HVAC hood and several small vents were removed. Minor repairs were also made to downspouts, and new roof flashing and gutter drain screens were fabricated and installed in some places.

Many of the teak, mahogany, fir and cedar window frames and doors were deteriorating, so dirt, paint and varnish were removed and the wood was treated with the Amteco sealer. Window screens were found in even worse shape, so they, too, were removed for repair. "They were very fragile and dilapidated from exposure and use," says Griswold. "We were able to return all of them to good working order without replacing original material with new wood." Non-original finishes were stripped and the non-historic nylon screen fabric was replaced with bronze-wire screens. Aiding in the repair of the damaged screens were 11 unused screens found in basement storage, screens that had never been installed on the house. "We were able to get a glimpse of the original screen fabric material and the finish," says Griswold. These screens were later returned to archival storage.

Another part of the project involved the restoration of the wood railings around the sleeping porches. Weathering and dirt had taken their toll, and the railings needed to be cleaned, stripped and then finished with an oil-based preservative. "Once treated, beautiful grain figure emerged where surfaces had only appeared black before," says Griswold.

After repairs on the main house were completed, the deteriorated rafter tails, windows, doors and shakes of the single-story garage, which serves as the Gamble House bookstore, were treated. The roof was also replaced.

In August 2004, the first comprehensive conservation to be undertaken on the Gamble House was completed on budget and on schedule. The most gratifying aspect, McLeod says, "was the honor of contributing to and participating in the conservation of a valuable national treasure."
– *Hadiya Strasberg*

Dirt, paint and varnish were removed from window frames and the wood was then treated with Amteco sealer.

Westcott Revisited

An extensive restoration aims to return Frank Lloyd Wright's little-known Wescott House to its original condition.

PROJECT: WESTCOTT HOUSE, SPRINGFIELD, OH

ARCHITECTS: CHAMBERS, MURPHY & BURGE RESTORATION ARCHITECTS, AKRON, OH; ELIZABETH CORBIN MURPHY, AIA, PRINCIPAL & LAUREN PINNEY BURGE, AIA, PRINCIPAL AND PROJECT ARCHITECT; SCHOOLEY CALDWELL ASSOCIATES, COLUMBUS, OH; ROBERT D. LOVERSIDGE, JR., FAIA, PRESIDENT/CEO & DAVID A. VOTTERO, AIA

GENERAL CONTRACTOR: THE DURABLE SLATE CO., COLUMBUS, OH

ARCHITECTURAL CONSULTANT: THE BURLEY PARTNERSHIP, WAITSVILLE, VT; ROBERT BURLEY, FAIA, FOUNDING PARTNER

Frank Lloyd Wright's Westcott House in Springfield, OH, underwent an extensive restoration that began in 2000 by Akron, OH-based Chambers, Murphy & Burge Restoration Architects. *Photo: Courtesy of Shawn Beckwith*

The Westcott House in Springfield, OH, the not-so-famous and highly altered sister of Frank Lloyd Wright's other houses, nevertheless embodies his innovative Prairie School design. In 2000, the Frank Lloyd Wright Building Conservancy and the Westcott House Foundation set out to prove it, by beginning an extensive restoration to bring the house back to its original state, and therefore its original significance in architectural history.

The 5,000-sq.ft. house was designed, redesigned and built between 1907 and 1908 for automotive manufacturer Burton J. Westcott. "Wright's clients tended to be progressive, and Westcott, as an early car manufacturer, was right at the cutting edge of technology," says John Zukowsky, executive director with the Westcott House Foundation. This is reflected in the two outbuildings near the Westcott House – a combination stable and garage. (The Robie House, built in 1909, was the first Wright house built with only a garage.)

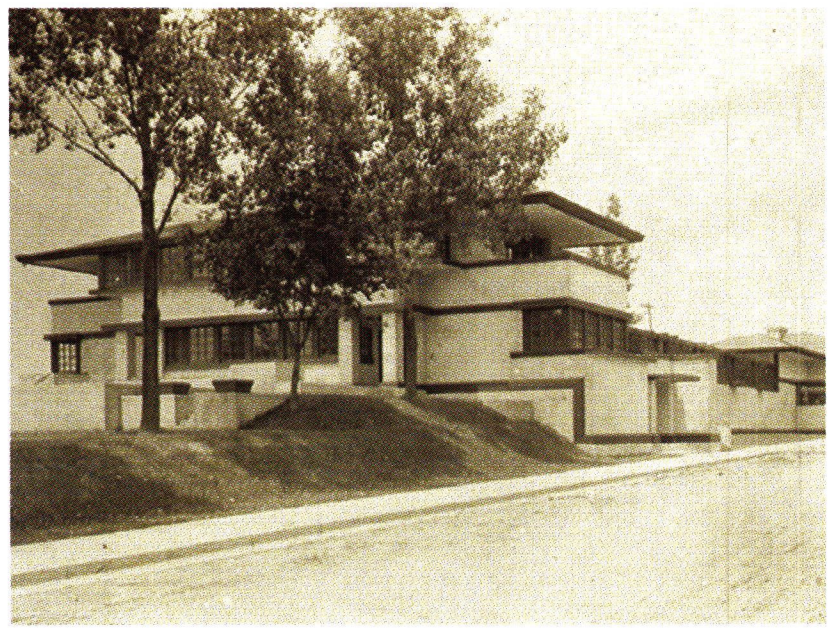
"This is the only Prairie-style Wright house in Ohio, so it's very significant" says Lauren Pinney Burge, principal and project architect with Akron, OH-based Chambers, Murphy & Burge Restoration Architects (CMB), the firm hired to restore the house. The architects hired Frank Lloyd Wright expert Robert Burley, FAIA, of the Waitsville, VT-based Burley Partnership, who was the director of Taliesin in Wisconsin, as a consultant. The house is situated on a corner lot, with an entrance on a side street that comes up from street level to the main level. A terrace, a pool and gardens all were designed to tie the house to its site. The garage and stable were constructed of concrete poured around 2x4 studs. The house and the garage are connected by a walkway that has a pergola with an intricate wooden trellis. "This is a very significant feature since Wright didn't use pergolas that often," says Burge. "The connection of the main house and the garage makes the entire line of the side elevation much longer, stressing the horizontality in which Wright was so interested." An addition, put on some time after 1920 and removed with this project, ruined Wright's siting. "One thing that drove us to restore the house to 1908 was the impact the addition had not on the house, but on how the house sat on the site," explains Burge. "The site is long and narrow. Rather than placing the house along the narrow lines of the site, Wright placed it across, so the south lawn was public, while the north courtyard was private. The addition sat in the north courtyard, deeply altering the exterior space."

The house was split into seven apartments in the 1940s. The conversion of the open floor plan into multi-unit changed the architecture significantly, so much so that it no longer reflected the design intent of its architect. "Wright's original design had matching master suites, each with sleeping porches and a huge cantilevered roof overhang – this was a primary feature of the building," says Burge. When the building was converted into apartments, the porches were filled in and closed off to make kitchens.

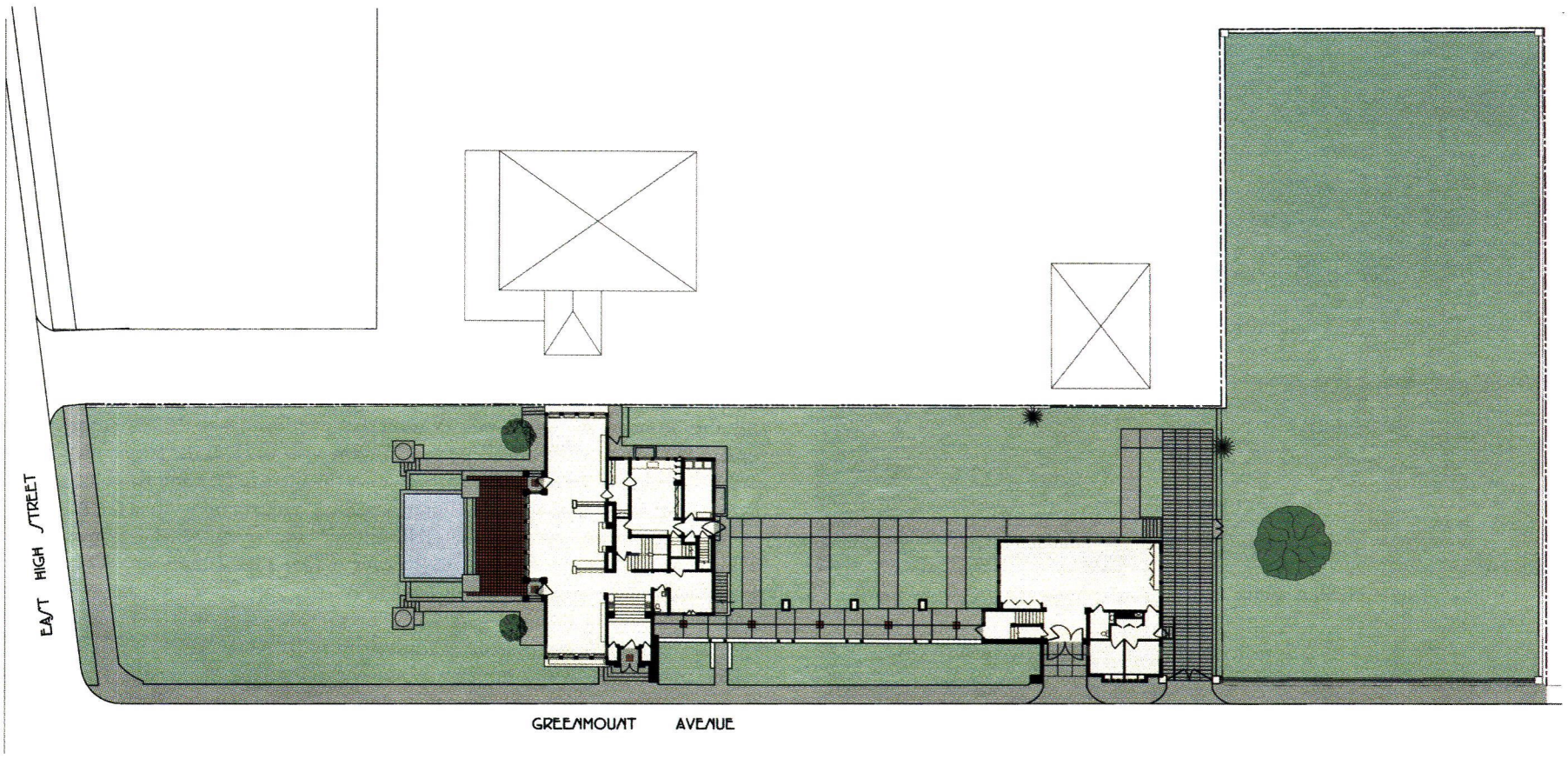
Years of neglect led to extensive damage to the house. The support beams on the house sagged and every element, excepting the first-floor fireplace, shifted as much as 4½ in., so extensive supports were required additions. "The double 2-in. sill members that the exterior wall sits on were completely crushed," says Burge. Instead of 4 in. tall, they were ½ in. tall. Termites also harmed the house extensively, turning the ends of major beams in the main house as well as the garage into powder. "The main beam of the first-floor framing was completely eaten away by termites," she adds. "You could stick a pencil through 6 in. of lumber."

In 2000, the Frank Lloyd Wright Building Conservancy in Chicago, IL, offered to help the then owner, who couldn't handle the maintenance by herself, by buying the house. Emergency stabilization was done, and a

The Westcott house restoration comprises three phases, the first of which included installing a new red clay-tile roof – the original had been removed in the 1960s due to a fire and replaced with asphalt.



The house, the only Prairie-style Wright house in Ohio, was built between 1907 and 1908 for automotive manufacturer Burton J. Westcott. *Photo: Courtesy of the Clark Co. Historical Society*



The site map and east elevation drawing show how Wright achieved an emphasis on horizontality by tying the main house to the garage with a walkway and pergola. *Drawings: Chambers, Murphy & Burge Restoration Architects*

foundation was formed in Springfield to take over ownership. The Westcott House Foundation acquired the house in 2001, but the Frank Lloyd Wright Building Conservancy still has conservation easement and input into the care of the structure.

The restoration comprises three phases. Phase One, begun in September 2002 and completed in May 2003, included installing a new tile roof, excavating part of the basement, stabilizing the structural elements and removing additions. Phase Two began in February 2004, and comprised exterior stucco restoration, window restoration, refinishing wood trim, replacing the reflecting pool that was sited at the front of the house (it had been removed in the mid-1980s or '90s in order to make structural repairs on the front of the house) and planting flora – which was handled by Carol Yetkin of Oak Park, IL-based CYLA Design Associates, Inc. – as well as installing mechanical, electrical, fire and security infrastructure elements, which was handled by Columbus, OH-based Schooley Caldwell Associates, an architectural and engineering firm that partnered with CMB on this project.

On the interior, the wood floors will be cleaned and refinished; the ceiling and wall plaster will be repaired; brickwork will be stripped of paint, cleaned and repointed; and art glass will be restored. The final phase, to be conducted from 2005 to 2006, will comprise the addition of interpretive furnishings, restoration of the façades of residences contemporary to Westcott House (now commercial spaces) and hiring staff and developing educational programming for the house.

"The biggest challenge," says Burge, "was that we had very limited information on how the house was actually built. We have two interior historic photographs, but they were taken during construction. We have all the original drawings, but we know for certain that Westcott House was not built exactly like the drawings." For instance, a playroom was added sometime either in a later set of drawings that they didn't have or during construction. "We had to try to interpret by physical evidence, for instance the ghost outline of trim," she adds. The team didn't know what the north elevation looked like, since so much had changed from the drawings to the completed building. So they drew a conjectural one, but when they started some framing repair, they found evidence of nail holes and framing headers that revealed exactly where the windows had been – which wasn't where they were going to put them.

Luckily, the restoration of the roof wasn't one of the more difficult aspects. The original roof, fabricated from custom red clay tile, was removed in the 1960s after damage from a fire. Asphalt shingles had been used to replace the original tile, but the last three rows of original tile had been left beneath, giving the architects a good idea of the range of color used. "When we first found the roof tile we only found pieces – it was like putting together a jigsaw puzzle," says Burge. Just like a jigsaw, however, things began to come together as they worked on the roof. A dozen broken fragments of the original tile were found beneath the hipped roof of the addition by Matt Cline, Westcott House Foundation site manager, revealing the lengths and sizes of the tile originally used.

To replace the roof, the architects hand selected custom-made tile from Ludowici Co. of New Lexington, OH, in order to duplicate Wright's color range and style. Winter weather was one challenge the team faced with the installation, since cold makes tile brittle. "Cold weather makes the tile installation difficult for many reasons, workability, moisture problems and worker safety to name a few," says Burge. Replacement tile has been stored in case of future damage, although the architects are counting on the roof to last at least 100 years. The new roof has four layers, including the original decking with some replacements, an ice and water shield for the tile, a heavy-grade roofing paper and copper nails to secure the tile.

A new drainage system was also required because of water damage to the exterior. Hoppes Engineering of Springfield, OH, designed the storm water removal system. "Wright designed the system without downspouts – at the eaves, built-in gutters were placed all the way around, with little spouts at the corners," explains Burge. "The little spouts empty the gutter, fall into a concrete catch pad and drain below it. The water was expected to fall straight down." Downspouts that had been added at a later date were removed and the 2x2-ft. catch pads were restored and replaced where missing, along with the gutters and little spouts, so as not to take

An addition, put on some time after 1920 (above) and removed with this project (below), ruined Wright's siting.

A worker removed infill from the badly damaged house. *Photo: Chambers, Murphy & Burge Restoration Architects*

The top layer of the exterior stucco was very thin, so much of it was washed away by rain. Special work was done to formulate stucco to match the original. *Photo: Chambers, Murphy & Burge Restoration Architects*

away from the appearance of the building. These were supplemented by a new perimeter drain system in the ground to avoid further damage.

The exterior stucco was in sound condition, for the most part. There were a few cracks and holes, but because there were three layers, the bottom two were protected. The top layer was very thin, so a large amount of it had washed away. "Where the stucco had worn away we added another layer and blended it with the original," says Burge. "Special work was done to formulate stucco to match the original and to apply it in a manner that matched the dash brush finish." The team did 14 or 15 mockups in order to get the right match for the dash finish and application. "Otherwise, it just needed cleaning," she adds.

Other interesting features of the Westcott house are the windows. "The banded windows that wrap around the entire house are very unusual features of this house," says Zukowsky. "They're very distinct from Wright's other houses." Designed in a grid pattern with clear glass and no leading, they are "reminiscent of shoji screens and Japanese windows, clearly reflecting Wright's first trip to Japan in 1905," he says.

The window restoration was somewhat unusual itself, says Burge, because "in a normal wood window with divisions you have exterior putty that creates a beveled edge that allows water to drain off." The windows on the Westcott House, which were comprised of an exterior sash and an interior storm, had no putty edge. Instead, a small, flat wood stop was nailed on, which didn't allow water to drain off. As a result, water was getting into the window, and what little putty there was had deteriorated. "If you don't keep up with the painting," says Burge, "the wood will deteriorate." The windows were removed, the glass was taken out and cleaned and the stops were taken off. Where the windows had deteriorated, repairs were done with wood epoxies, and then the back of the stops were given a bevel in order to allow putty to grip the glass better and therefore drain water. The windows were then reinstalled with stainless-steel backs.

Two enormous concrete urns sit outside the front of the house. "They're said to be the largest Wright ever made," says Zukowsky. "They also reflect influences from Japan, and were some of the earliest he ever made – large urns were used in later Wright houses as well." The urns were in very good condition and didn't need to be restored.

The main level of the interior features three rooms facing the main street, a reception room/library and living and dining rooms, all of which are connected with an open floor plan. Originally, it was subdivided by low walls and inglenook benches on either side of a central fireplace. All of the furniture, including the benches, was designed by Wright, and all of it was missing, which will be addressed in Phase Three of this project by Schooley Caldwell.

Because the building had so much structural damage, says Burge, it shifted, causing the interior plaster to crack. In addition, there were many layers of paint on top of the original encaustic finish. "The original finish was wax, which was a huge benefit, because all of the overlayers of paint came off with heat," says Burge. The original paint scheme included golden browns and greens. Some spot repairs had to be done, and some plaster had to be removed due to the new mechanical systems. "We had to decide what we could afford to save and what we needed to save," says Burge. Other than a touch up on the wax coat, nothing more needs to be done in this area. "Several walls will need very little work," she adds.

The lighting presented a problem as well, since the fixtures had not yet been installed when the two interior photographs available to the architects had been taken. "We built full-size models of several light fixtures based on design drawings we found," says Elizabeth Corbin Murphy, principal with the architectural firm. "After reconstructing them, we discovered that it was possible that some were never built." The architects used shadows on the walls and drawings to put up the ones that had definitely been built and installed. "We'll just save the extras," says Murphy.

The original skylight, above the hall stair, had been altered quite a bit. The original glass had been taken out, and wire glass put in. "We found a 7-in.-long piece of the original ribbed glass in the attic," says Burge. "We couldn't put that back in because of code, but installed matching glass in a sandwich of special laminates to give a similar appearance."

With this restoration, another piece of architectural history – and another beautiful Frank Lloyd Wright house – has been saved. "The Westcott House is going to be a spectacular house when it's done," says Zukowsky. "It provides the missing link between the Prairie style and Japan." – *Marieke Cassia Gartner*

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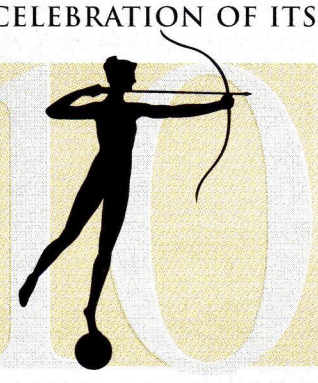

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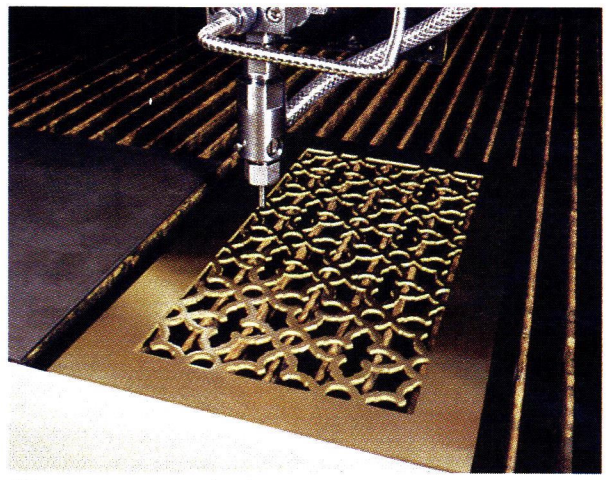

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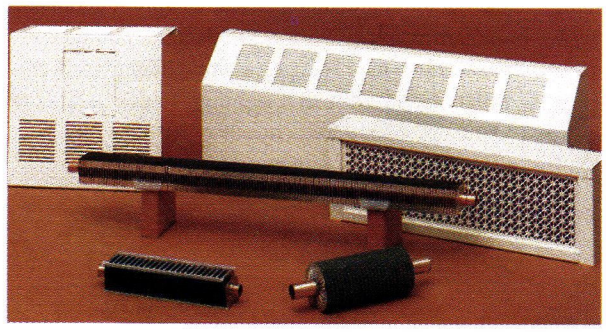


Radiator covers, fin-tube covers and fan-coil covers are available in various styles from Arsco.

Authentic Designs
800-844-9416; Fax: 802-394-2422
www.authenticdesigns.com
West Rupert, VT 05776

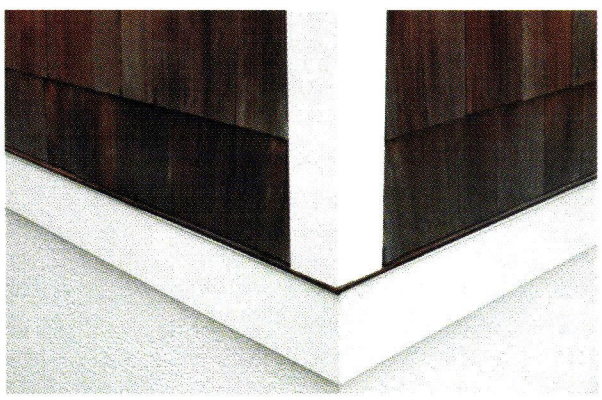
Manufacturer of Early American & Colonial lighting fixtures: brass, copper & Vermont maple; exterior mountings; CUL/UL-listed for wet & damp locations; lanterns, sconces, table/floor lamps, chandeliers, pendants, ceiling fixtures & custom fixtures.
Write in No. 60

The Stirling from Authentic Designs is manufactured from restoration glass and copper.

Auton Motorized Systems

661-257-9282; Fax: 661-295-5638
www.auton.com
Valencia, CA 91355

Manufacturer of lifts: remote-controlled motors to lift & lower TVs, projectors, speakers & mini-elevators on rack & pinion systems; dumbwaiters & vertical lifts.
Write in No. 2617



Architectural trim from AZEK Trimboards can be used in a variety of applications.

AZEK Trimboards

877-275-2935; Fax: 570-504-1215
www.azek.com
Moosic, PA 18507

Manufacturer of cellular-PVC siding & trim with the look & feel of lumber: standard trim dimensions, sheet sizes & bead board; cut, routed, milled & fastened using traditional woodworking tools; easily bent or shaped;will not rot, crack, split or warp.
Write in No. 338

Ball & Ball Lighting

610-363-7330; Fax: 610-363-7639
www.ballandball.com
Exton, PA 19341

Manufacturer of historical lighting: interior & exterior; 18th-, 19th- & early-20th centuries; lanterns, sconces, table/floor lamps, chandeliers, pendants & ceiling fixtures; custom designs; restoration & refitting; wall-, post- & pillar-mounted porch lighting; Colonial & Turn of the Century; brass, glass, copper & iron.
Write in No. 7660

This elaborate fixture with lion-head detail was manufactured by Ball & Ball Lighting.

Bathroom Machineries, DEA

209-728-2031; Fax: 209-728-2320
www.deabath.com
Murphys, CA 95247

Supplier of Early American & Victorian bathroom fixtures & accessories: antique & reproduction bathroom fixtures; tubs, high-tank toilets, pedestal sinks, original light fixtures, medicine cabinets, mirrors & many one-of-a-kind items; registers & grilles; since 1976.
Write in No. 1725

This ca. 1900 restored marble basin with backsplash and marble skirt, rope brass legs and glass ball feet is typical of the hard-to-find historic fixtures available from Bathroom Machineries.

Bradbury & Bradbury Art Wallpapers

707-746-1900; Fax: 707-745-9417
www.bradbury.com
Benicia, CA 94510

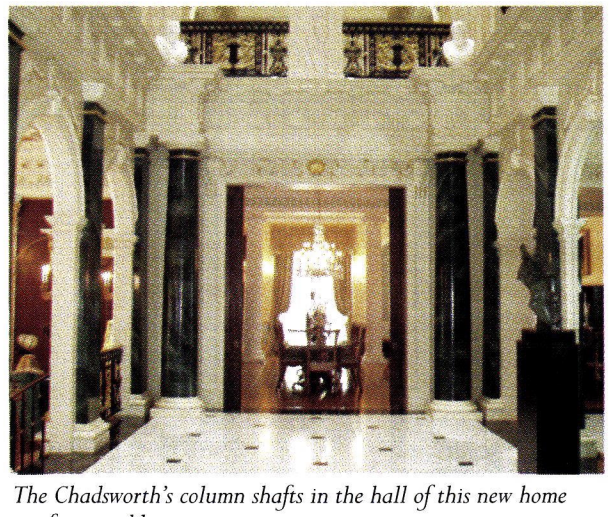
Manufacturer of hand-silk-screened wallpaper: Arts & Crafts, Victorian & Neoclassical styles; broad selection of borders, friezes & ceiling decorations; in-house design service; full mail-order catalog.
Call for more information

This Cameo Panel, manufactured by Bradbury & Bradbury, is one of eight modular ceiling elements available in their Neoclassical suite.

Chadsworth's 1.800.Columns

800-265-8667; Fax: 910-763-3191
www.columns.com
Wilmington, NC 28401

Manufacturer of authentic interior & exterior molded ornament: columns & capitals, pergolas, pillars, pilasters & balustrade systems; new Classic Pergolas with 2-, 4-, 6- & 8-column kits; plain or fluted shafts in a variety of sizes & styles; molded polymers, polymer/stone composites & variety of lumber species; worldwide delivery.
Write in No. 1580

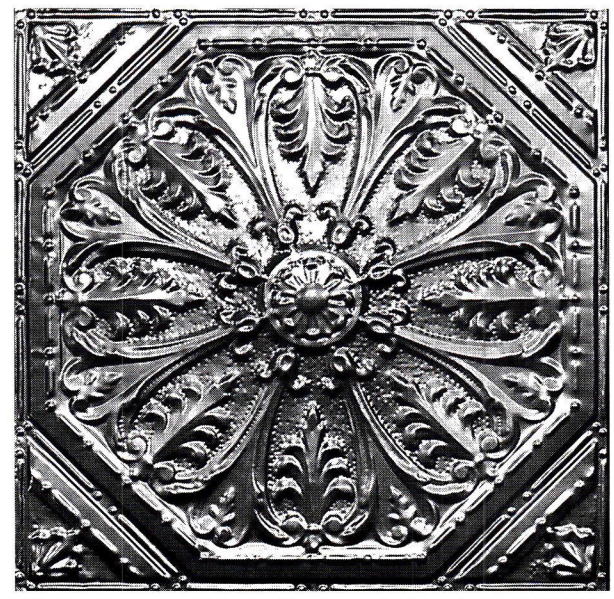


The Chadsworth's column shafts in the hall of this new home are faux marble.

Chelsea Decorative Metal

713-721-9200; Fax: 713-776-8661
www.thetinman.com
Houston, TX 77074

Manufacturer & supplier of pressed-tin panels for walls, backsplashes & ceilings: stamped metal sheets in 2x4-ft. sections for easy installation; cornices in 4-ft. lengths, 2 to 9 in. widths; Victorian, Art Deco & other styles; 6-, 12- & 24-in. repeat patterns; 2x2- & 2x4-ft. suspended ceiling sheets; tin-plated steel for paint retention; shipped anywhere.
Write in No. 190



Chelsea Decorative Metal offers pressed-tin ceilings in 2x4-ft. sheets with 3-, 6- or 24-in. repeat patterns.

Christopher Thomson Studio

505-421-2645; Fax: 505-421-2618
www.ctiron.com
Ribera, NM 87560

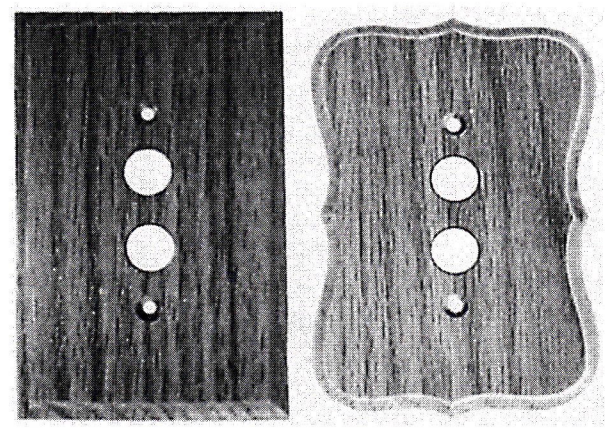
Designer & artist/blacksmith of hand-forged, traditionally joined ironwork: architectural lighting; old-world to contemporary styles; UL-approved interior & exterior lighting; catalog $20.
Write in No. 8069

This custom ceiling fixture, designed by Christopher Thomson Studio, was fabricated for a residence in Upper Canyon Road, Santa Fe, NM.

Classic Accents, Inc.

800-245-7742; Fax: 734-284-7185
www.classicaccents.net
Southgate, MI 48195

Supplier of UL-listed push-button light switches: plain or ornamental brass & wooden plates; brass molding hooks, decorative tassels & picture-hanging cord.
Write in No. 371



Classic Accents supplies push plates in oak.

Gulf Coast Contracting, Boca Grande, FL

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Cambridge Homes, Baldwin Park, FL

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(877) 275-2935

WRITE IN NO. 338

Clawfoot Supply distributes bathtubs and other bathroom fixtures.

Clawfoot Supply

877-682-4192; Fax: 859-431-4012
www.clawfootsupply.com/ph
Erlanger, KY 41018

Distributor, importer & retailer of cast-iron & acrylic clawfoot & soaking tubs: hard-to-find Victorian & traditional bath fixtures & hardware; reproduction fixtures, antique/original fixtures, faucets, showers, fittings & period sinks & toilets; bathroom hardware & accessories; free 92-page color catalog.
Write in No. 576

The Color People offers consulting services on custom exterior paint schemes for historical homes.

Color People, The

303-308-0220; Fax: 303-308-0123
www.colorpeople.com
Denver, CO 80205

Color consultant: custom exterior color schemes for houses, businesses, Main Streets & townscapes; Victorian specialist; consultation through photos via mail; some on-site consulting.
Write in No. 5470

Concrete Designs Inc.

800-279-2278; Fax: 520-624-3420
www.concrete-designs.com
Tucson, AZ 85713

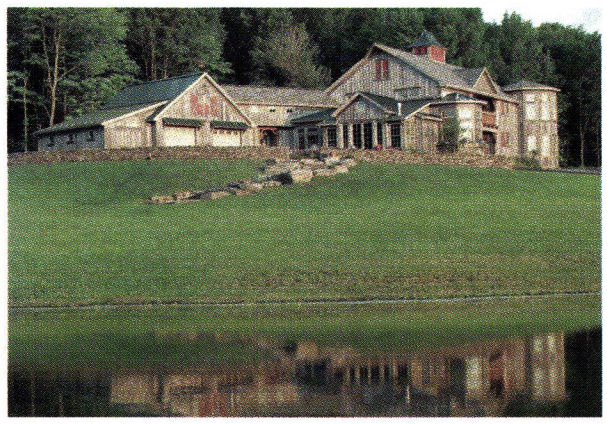
Manufacturer of more than 1,600 precast-stone, concrete & GFRC items: cornice moldings, door & window surrounds, balustrades, columns & capitals, brackets & corbels; stock, custom & antique mantels.
Write in No. 5190

Antique-textured columns from Concrete Designs complement this Tucson, AZ, residence.

Conklin's Authentic Barnwood

570-465-3832; Fax: 570-465-3835
www.conklinsbarnwood.com
Susquehanna, PA 18847

Wholesale distributor of antique barn wood & hand-hewn beams: flooring in white pine, chestnut, antique heart pine, pine, antique oak & hemlock; hewn rafters, pole rafters & half-rounds; wide-board, strip & random-width flooring.
Write in No. 578

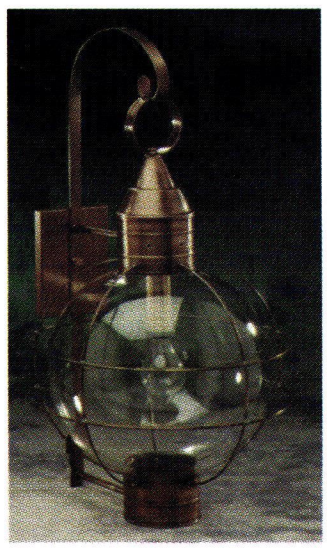


Conklin's antique barn wood and hand-hewn beams were used to create this building.

Coppersmythe, Josiah R.

508-432-8590; Fax: 508-432-8587
www.jrcoppersmythe.com
Harwich, MA 02645

Manufacturer of hand-crafted lighting: sconces, chandeliers & lanterns; Turn of the Century, Colonial & Arts & Crafts/Mission/Prairie; styles & sizes can be modified to meet specific client needs.
Call for more information



Josiah R. Coppersmythe meets clients' specifications in the design and fabrication of the company's lighting fixtures.

Country Road Associates, Ltd.

845-677-6041; Fax: 845-677-6532
www.countryroadassociates.com
Millbrook, NY 12545

Manufacturer & distributor of 19th-century reclaimed flooring materials, barn siding & hand-hewn beams: white pine, hemlock, heart pine, white oak, chestnut & black walnut; wide board & random width; custom cabinetry & furniture.
Write in No. 7480 for flooring; 475 for cabinetry

County Road Associates builds traditional furnishings from 19th-century barn wood.

This chandelier, model #CH-8000 from Deep Landing, features eight arms with electric candle fixtures.

Deep Landing Workshop

877-778-4042; Fax: 410-778-4070
www.deeplandingworkshop.com
Chestertown, MD 21620

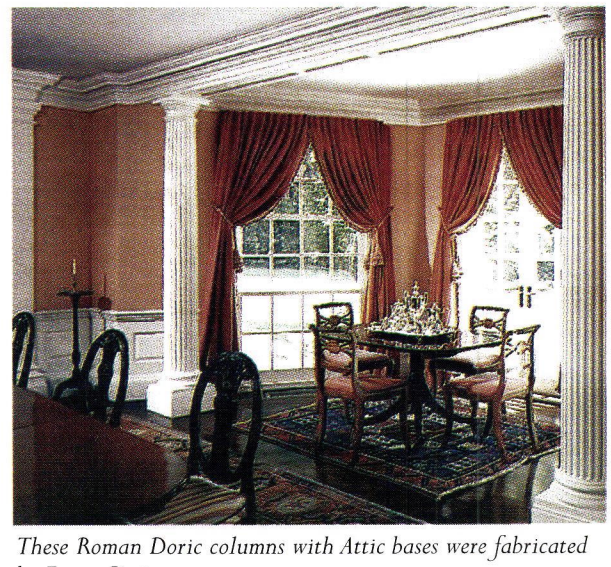
Designer & manufacturer of interior & exterior lighting fixtures: stylized reproductions or original designs to complement a period; tin wall sconces, wood & wrought-iron chandeliers, large entrance & post lanterns in brass or copper; graining, gilding & other finishes.
Write in No. 809

Wood stairs in both custom and standard designs are available from Deer Park Stairbuilding.

Deer Park Stairbuilding & Millwork

631-363-5000; No fax
P.O. Box 107
Blue Point, NY 11715

Designer & fabricator of wood stairs & rails: straight, curved, circular & spiral stairs; millwork.
Write in No. 1107



These Roman Doric columns with Attic bases were fabricated by Fagan Design.

Fagan Design & Fabrication, Inc.

203-937-1874; Fax: 203-937-7321
www.fagancolumns.com
West Haven, CT 06516

Manufacturer & custom fabricator of wood columns, cylinders, rope twists, large turnings, octagons & pilasters: Classical order; load bearing & ornamental; columns also in plaster/gypsum, custom FRP fiberglass & GFRC; up to 42 in. in dia. & 24 ft. long.
Write in No. 8210

Union Station Hotel, *Nashville, Tennessee*
This historic restoration involved over 1,000 new and restored castings with 500 linear feet of vintage railing crowned with bronze moulding.

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WRITE IN NO. 1005

The Iris gate, featuring forged leaves and flowers, was custom fabricated by Fine Architectural Metalsmiths.

Fine Architectural Metalsmiths

888-862-9577; Fax: 845-651-7857
www.iceforge.com
Chester, NY 10918

Custom fabricator of ironwork: lanterns, sconces, ceiling fixtures & other lighting; restoration & refitting of lighting fixtures; period gates & fencing, railings & newel posts; period-design wine racks, grillework & wine cellar doors; benches, arbors, pergolas, finials & fireplace screens; decorative copper wall & ceiling tile; forged iron, stainless steel, aluminum & forged & fabricated bronze; hand- & hot-forge work; patination; design-through-installation service.
Write in No. 2640

Fireside Distributors

866-880-3473; Fax: 919-327-0031
www.victorianhearth.com
Raleigh, NC 27604

Supplier of European fireplaces & fireplace accessories: heating stoves, gas & wood-burning fireplaces, firebacks, fireplace screens, gas logs, fire grates, tool sets, hearth rugs, electric fireplaces & more.
Write in No. 1200

This ceiling medallion is one of many hand-crafted pieces of plaster ornament available from Fischer & Jirouch.

Fischer & Jirouch

216-361-3840; Fax: 216-361-0650
www.fischerandjirouch.com
Cleveland, OH 44103

Manufacturer of hand-crafted architectural ornament: interior & exterior; casting & PC plaster; mantels, cornice moldings, door & window surrounds, ornamental ceilings, ceiling medallions, niches & domes, brackets & corbels; ornamental wood & plaster/gypsum columns up to 34 in. in dia. & 42½ in. long; pilasters & capital bases; custom work.
Write in No. 1960

Florentine Craftsmen, Inc.

800-876-3567; Fax: 718-937-9858
www.florentinecraftsmen.com
Long Island City, NY 11101

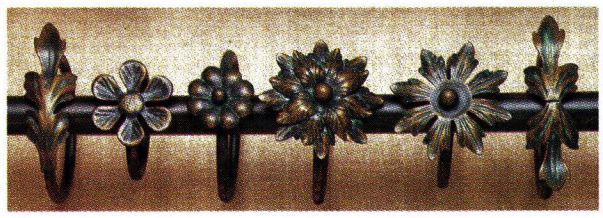
Manufacturer of ornamental metalwork & stonework: garden elements, gazebos, treillage, sculpture, furniture, tiered & wall fountains, ground basins for fountains, water gardens & supplies, planters & urns, gates, non-load-bearing columns & more; bronze, cast aluminum, carved & cast stone, lead, cast iron & wrought iron/steel.
Call for more information

This goose fountain was manufactured by Florentine Craftsmen in lead and piped with an upward jet.

Gaby's Shoppe

800-299-4229; Fax: 214-748-7701
www.gabys.com
Dallas, TX 75207

Supplier of hand-crafted interior metalwork: wrought-iron drapery hardware, lighting & furniture; hand forged & hand finished.
Write in No. 2520



Gaby's Shoppe offers a variety of decorative drapery hardware, including these floral rings.

Good Time Stove Co.

413-268-3677; Fax: 413-268-9284
www.goodtimestove.com
Goshen, MA 01032

Supplier of antique kitchen ranges & heating stoves: ca. 1840-1930; restored enamel, cast-iron, wood & wood-gas combos; electric conversions; wood- & gas-burning fireplaces & stoves.
Call for more information

Good Time Stove supplies antique wood stoves such as this ca. 1880-1910 model.

Hallidays America, Inc.

973-729-8876; Fax: 973-729-5149
www.hallidaysamerica.com
Sparta, NJ 07871

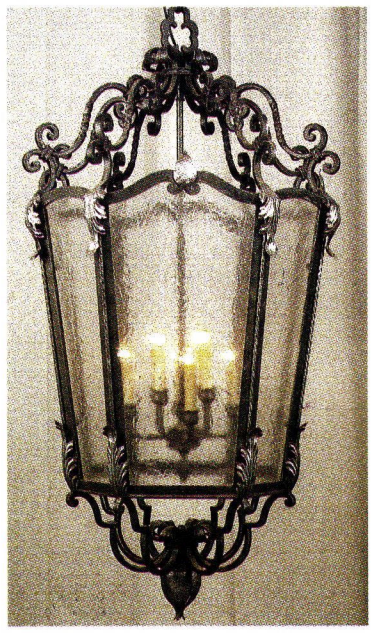
Custom fabricator of hand-crafted, period-design architectural detailing: mantel pieces, paneled rooms, cabinetry, furniture & hand-carved moldings; all work is done in workshops in England & Ireland.
Write in No. 253

This detailing was hand carved by the craftspeople at Hallidays.

Hans Duus Blacksmith, Inc.

805-688-9731; Fax: 805-688-1793
www.hansduusblacksmith.com
Buellton, CA 93427

Blacksmith & supplier of forged lighting: chandeliers, wall sconces, pendants & exterior lighting.
Write in No. 8041

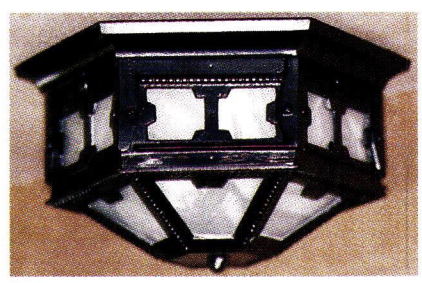


This five-light fixture from Hans Duus was custom designed and hand forged specially for a client.

Herwig Lighting

800-643-9523; Fax: 479-968-6422
www.herwig.com
Russellville, AR 72811

Manufacturer of custom & hand-crafted interior & exterior lighting fixtures: furniture, fences & gates, plaques, signage, street clocks & cast-aluminum posts to 14 ft.; since 1908.
Write in No. 9130



The model #H2 ceiling fixture was made of a cast aluminum alloy and opal glass by Herwig Lighting.

Hyde Park Fine Art of Mouldings, Inc.

718-706-0504; Fax: 718-706-0507
www.hyde-park.com
Long Island City, NY 11101

Manufacturer of ornamental plaster & gypsum crown moldings, friezes & coffers: cornice moldings, mantels, non-load-bearing columns, capitals, ceiling medallions, ornamental plaster ceilings, domes & brackets; stock & custom; fabricated using traditional European methods; restoration & renovation services.
Write in No. 45

The plasterwork experts of Hyde Park have transformed this interior, contributing the columns, pilasters, chair railing, wall panels, decorative frieze molding and ceiling coffers with rosettes.

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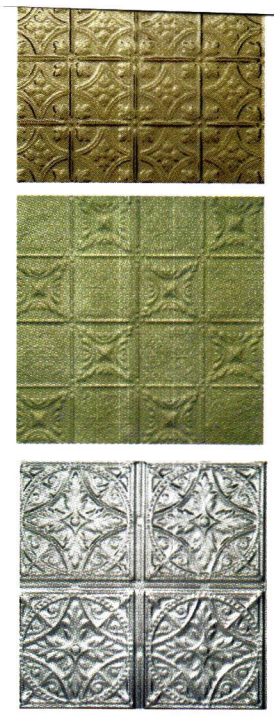

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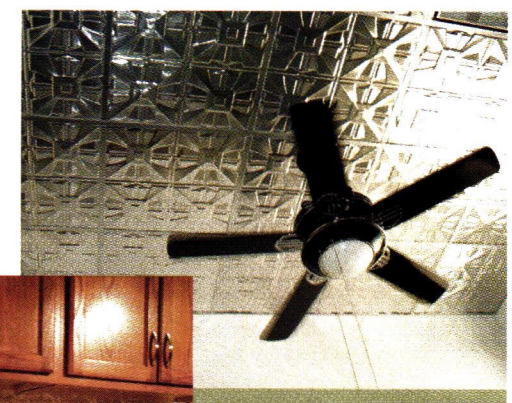

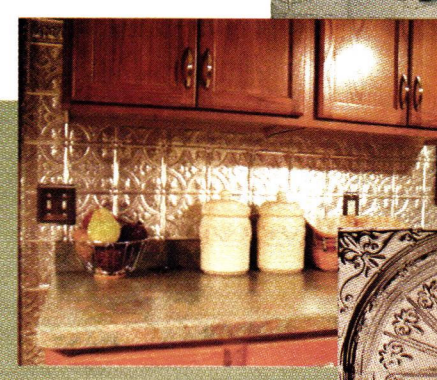

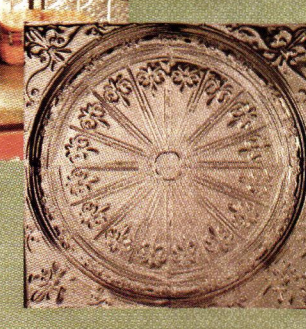

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In the past tin ceilings were used in stores and houses to add durability and charm to interior ceilings. Today, pressed metal panels can go beyond just a ceiling application. Define your own style with one of these ideas:

backsplashes • door insets • moldings • wainscoting • medallions • fireplace accents

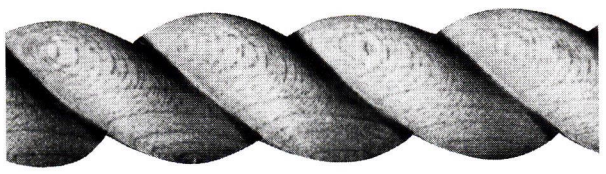
www.mbossinc.com

WRITE IN NO. 340

JMS Wood Products

818-348-7230; Fax: 818-348-7231
www.jmswoodproducts.com
Canoga Park, CA 91304

Supplier of rope moldings from 3/8 to 3 in. in dia. & rope columns from 4 to 24 in. in dia.: rope, fluted & twist designs for furniture or stairs; plinth blocks for door surrounds; porch parts; mantels; any wood species.
Write in No. 6320



Hardwood rope moldings from JMS Wood Products are available in diameters ranging from 3/8 to 24 in. and lengths up to 15 ft.

Kremer Pigments, Inc.

212-219-2394; Fax: 212-219-2395
www.kremerpigments.com
New York, NY 10012

Importer & distributor of plaster, glue & more than 500 natural & manufactured pigments: master & beginner classes in scagliola; Venetian plaster & colorants; wax products & lime washes.
Write in No. 4910

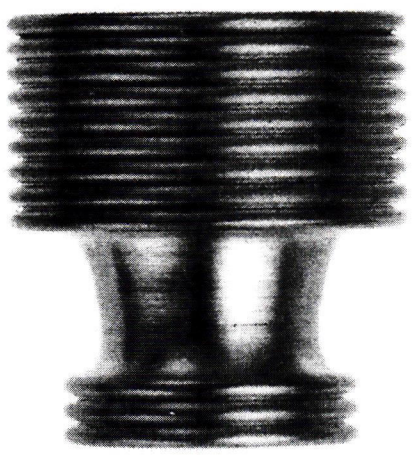
Natural earth pigments from Kremer Pigments were used to create this fresco of a bull, the symbol of St. Luke, the patron saint of painters.

Lantern Masters, Inc.

818-706-1990; Fax: 818-706-1988
www.lanternmasters.com
Westlake Village, CA 91362

Custom designer & fabricator of lanterns: traditional, Tudor, French, Tuscan, Asian, contemporary, Provençal, antique reproduction & other styles; chandeliers; interior & exterior wall sconces & pendants; exterior post & pilaster fixtures; upper-end residential & commercial.
Write in No. 267

Lantern Masters custom designed this exterior fixture.



The Aurora turning from Liberty Brass measures 31/32 x 1 1/16 in.

Liberty Brass Turning Company

718-784-2911; Fax: 718-784-2038
www.libertybrass.com
Long Island City, NY 11101

Manufacturer of custom-turned metal parts for all types of lighting: brass & aluminum solid balls drilled & tapped to client's specifications, half balls, check-rings, couplings, spindles, necks & finials; free catalog.
Write in No. 8440

Liberty Ornamental Products

800-636-5470; Fax: 419-636-2365
www.libornament.com
Bryan, OH 43506

Fabricator of precision die-cast ball tops, caps, finials, shoes & more: for fences, gates & ornamental assemblies; sizes from 1/2 to 4 in.; parts are exact-fit, die cast with non-rusting pewter finish; plastic ornamental finials & decorative scrolls; variety of colors.
Write in No. 5340

Limestone Concept, Inc.

310-278-9829; Fax: 310-278-9651
www.limestoneconcept.com
Los Angeles, CA 90035

Custom fabricator, importer & distributor of hand-carved elements: fountains, columns, balustrades, capitals, ornament, planters & urns, benches, garden statuary & sculpture; antique mantels & fireplaces; French limestone slabs & tile; antique terra cotta, natural-stone flooring & quarry tile; marble & carved stone.
Write in No. 5390

Detailed limestone mantels and overmantels are hand carved by the artisans of Limestone Concept.

M-Boss, Inc.

888-MBOSSINC; Fax: 216-641-7387
www.mbossinc.com
Cleveland, OH 44125

Manufacturer of tin ceilings: including cornice, molding, fillers & panels; more than 100 patterns & 11 specialty finishes; nail-up or lay-in; custom design & replication; for backsplashes, wainscoting, door insets & more.
Write in No. 340

The 4x4-ft. fleur de lis medallion from M-Boss, Inc., is available in copper in 11 finishes.

Maine Millstones

207-633-6091; Fax: 207-633-6095
www.mainemillstones.com
West Southport, ME 04576

Manufacturer & custom fabricator of hand-carved traditional granite millstones: for paving, fountains & garden ornament; all sizes & patterns; half millstones for doorsteps.
Write in No. 4440

This cornice and brackets are from Manor Style's Durastyl collection.

Manor Style, Ltd.

800-325-2188; Fax: 410-281-9362
6741 Whitestone Rd.
Baltimore, MD 21207

Nationwide supplier of load-bearing architectural columns, capitals & balustrade systems: cultured marble-resin (limestone finished), fiberglass composite & fabricated PVC; stock sizes to 48 in. in dia.; direct distributor of architectural PVC & preformed polymer elements; cornices, brackets & other trim; Fypon, Focal Point, Spectis, Durastyl, Century, CDM & other brands.
Write in No. 703

Native Tile & Ceramics

310-533-8684; Fax: 310-533-8453
www.nativetile.com
Torrance, CA 90501

Manufacturer of handmade decorative tile: floor inserts, trim, fireplace fronts, murals & tile rugs; Spanish Mission & Craftsman; custom designs & glazes.
Write in No. 570

Native Tile & Ceramics manufactures decorative tile in Mission, Craftsman and Art Deco styles.

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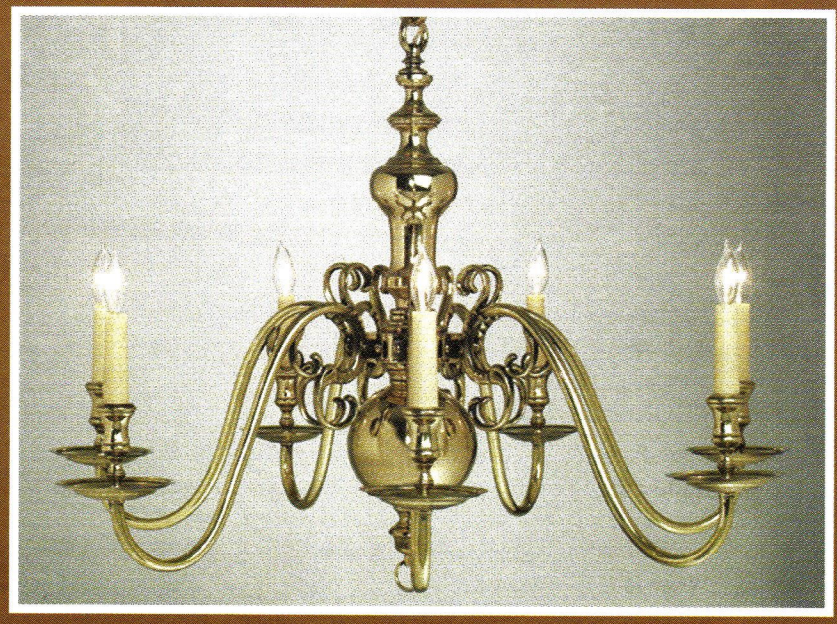

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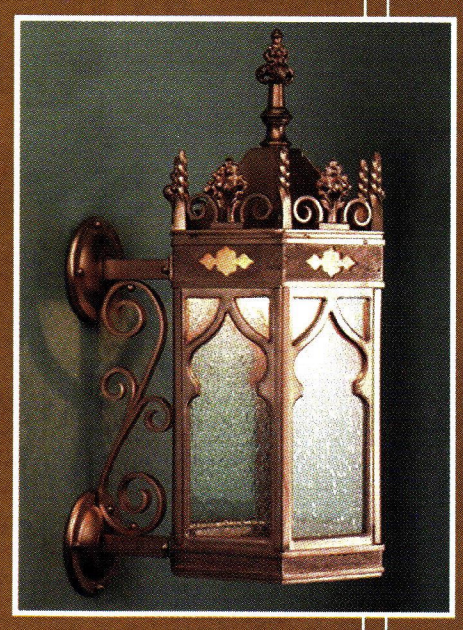

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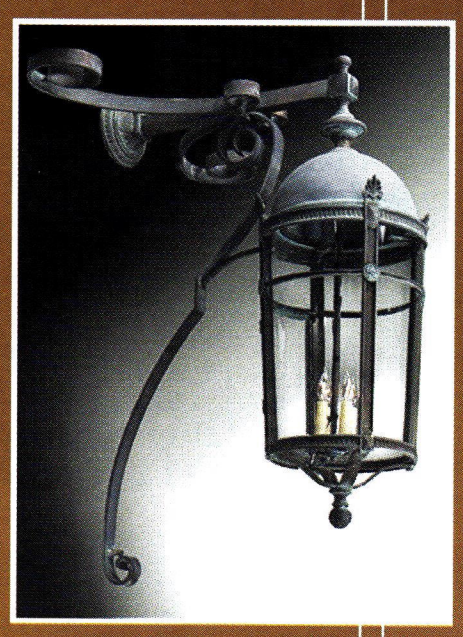

WRITE IN NO. 2930 FOR HARDWARE & NO. 7660 FOR LIGHTING

South County Post & Beam built this 56x32-ft. timber-frame barn on the existing stone foundation of a building that had been demolished.

South County Post & Beam

800-471-8715; Fax: 401-783-4494
www.scpb.net
West Kingston, RI 02892

Full-service designer & builder of timber frames since 1976: wide pine flooring; timber-frame & stress-skin-panel packages nationwide; general contracting regionally.
Write in No. 134

Victorian cast-iron and steel stairs, including this decorative spiral stair, are the specialty of Steptoe & Wife.

Steptoe & Wife Antiques, Ltd.

800-461-0060; Fax: 416-780-1814
www.steptoewife.com
Toronto, ON, Canada M6B 1V9

Manufacturer of cast-iron architectural elements: spiral & straight stairs, decorative balustrades & balusters, railings, gates, newel posts, handrails, treads, risers, ornamental ceilings & grilles; custom ornamental metal fabrication; arbors, gazebos & pergolas; cast aluminum & bronze & wrought iron/steel; contract manufacturing.
Write in No. 470

Steven Handelman Studios

805-962-5119; Fax: 805-966-9529
www.stevenhandelmanstudios.com
Santa Barbara, CA 93103

Manufacturer of hand-forged ornament, lighting & fire screens in iron: more than 250 choices of UL-certified lighting; incandescent, low voltage, HID & gas lamps; street lighting; Early California & European styles; gates, registers & grilles in wrought iron & steel; 50 styles of wrought-iron fire screens built in with doors or freestanding; stock & custom.
Write in No. 483

This two-candle sconce is one of many handmade period-style light fixtures offered by Steven Handelman Studios.

Sunrise Specialty Co.

800-444-4280; Fax: 800-937-2540
www.sunrisespecialty.com
Oakland, CA 94603

Manufacturer of classically designed bathroom fixtures: reproduction & antique fixtures, clawfoot tubs, oak tank toilets, period sinks, showers & fittings, water closets, bathroom hardware & bath accessories.
Write in No. 288

Superior Moulding, Inc.

800-473-1415; Fax: 818-376-1314
www.superiormoulding.com
Van Nuys, CA 91411

Supplier of standard & custom moldings & related finish materials: embossed, sculptured & polyfoam moldings; columns, capitals, ceiling medallions, niches, domes, corbels, furniture legs, mantels, appliqués & stair parts; complete line of hardwood flooring & related products; custom molding & millwork packages; short turnaround times; shipped worldwide.
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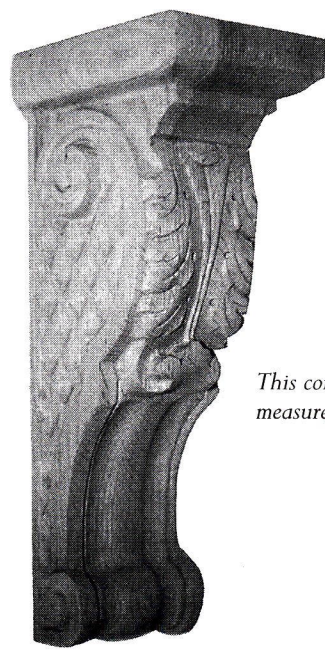

This corbel from Superior Moulding measures 4¼x5¼x13 in.

Tendura

800-836-3872; Fax: 334-566-2363
www.tendura.com
Troy, AL 36081

Manufacturer of porch flooring: TenduraPlank Classic, a composite lumber that comes with a factory-applied primer & looks & feels like real wood; primed & ready for finish painting; TenduraPlank Solid, a color-through battleship gray; requires no priming or painting.
Write in No. 652

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254-793-2384; Fax: 254-793-2693
www.texascarvedstone.com
Florence, TX 76527

Custom fabricator of hand-carved ornamental elements: columns, mantels, fountains & sculpture; Texas & Indiana limestone; any period or style.
Write in No. 1055

Texas Carved Stone's hand-carved limestone mantels often feature intricate detailing, such as this coat of arms.

Texas Metal Industries, Inc.

800-222-6033; Fax: 800-472-3807
www.texasmetalindustries.com
Crandall, TX 75114

Supplier of ornamental cast-aluminum products: outdoor furniture, lighting, gate & fence components, mailboxes, balusters, fountains, lampposts & urns.
Write in No. 9430

This four-light globe lamppost was manufactured by Texas Metal Industries.

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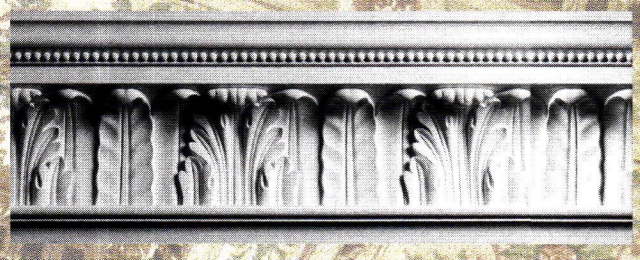

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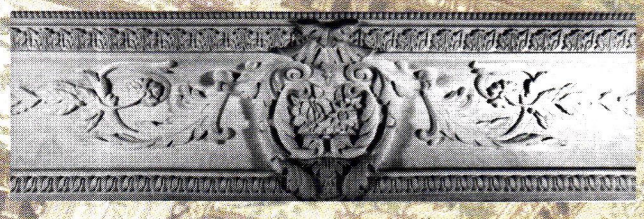

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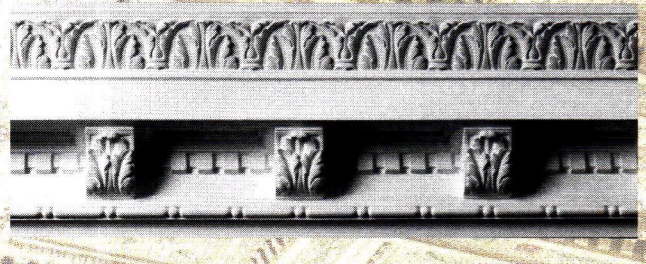

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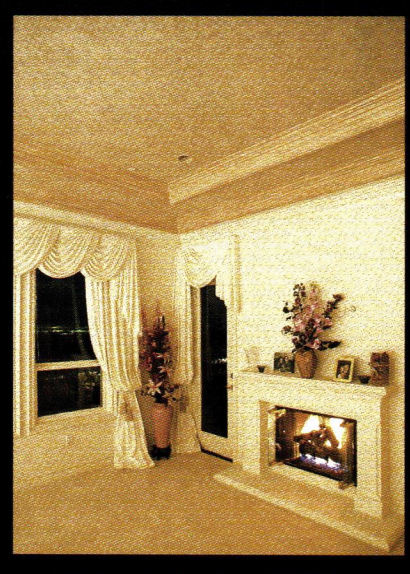

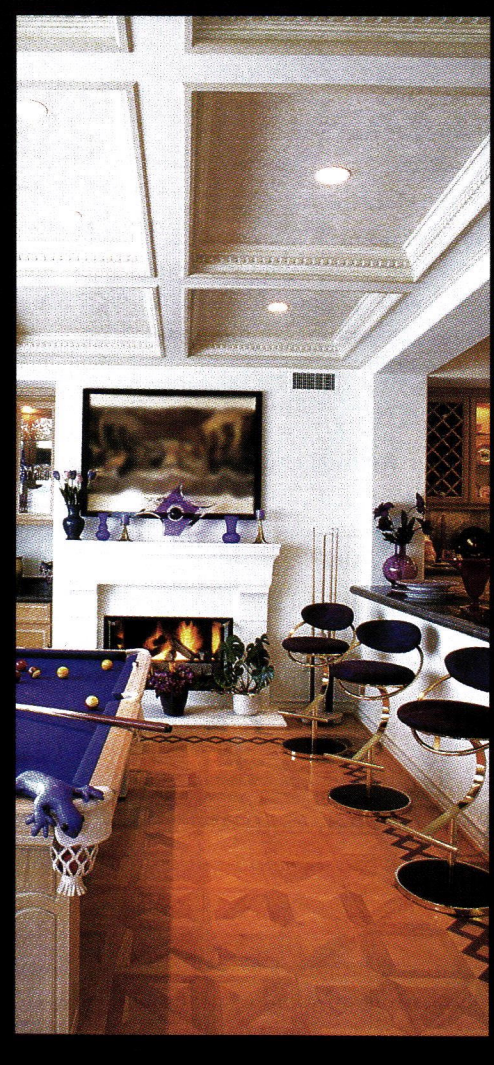

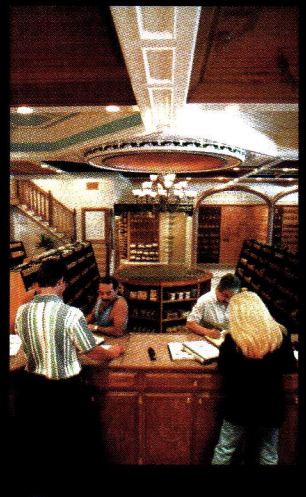

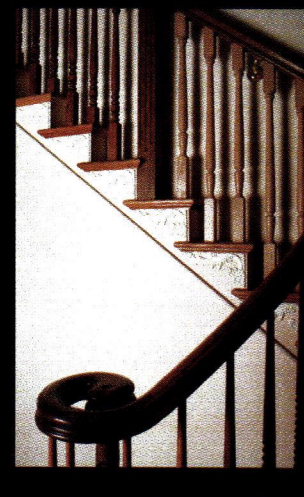

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www.whiteriversalvage.com
Indianapolis, IN 46208

Supplier of architectural antiques: mantels, lighting, hardware, garden accessories, doors, windows, millwork, furniture, flooring, registers, grilles, fireplace tools, plumbing & more.
Write in No. 1208

White River Hardwoods-Woodworks
800-558-0119; Fax: 479-444-0406
www.mouldings.com
Fayetteville, AR 72701

Manufacturer of moldings & carvings: Mon Reale high-relief hardwood moldings; Authentic Hand-Carved Woodcarvings in lindenwood, maple & cherry; UltraFlex resin curve work; smooth & embossed hardwood moldings & casings; mantels, ceilings, cornices & more; poplar & oak in stock & other species as custom order.
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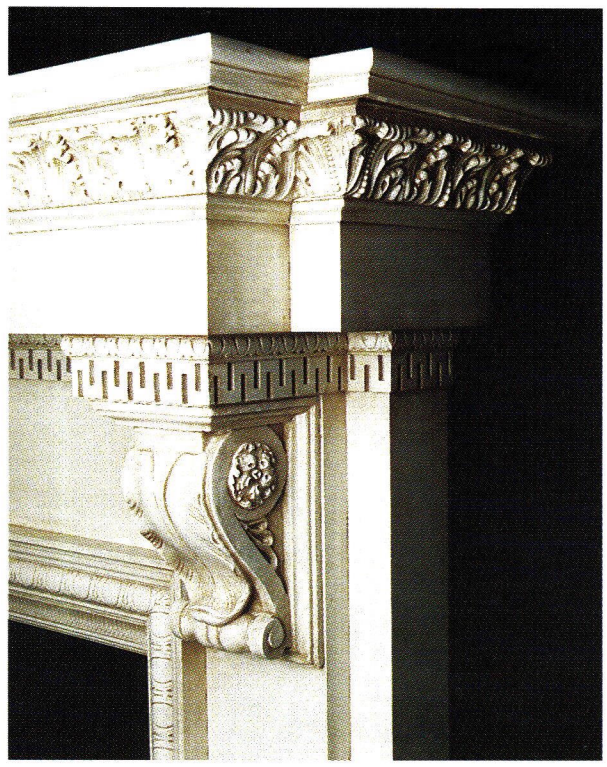

Moldings from White River Hardwoods-Woodworks were used to create this ornamental mantel.

Wiemann Ironworks
918-592-1700; Fax: 918-592-2385
www.wiemanniron.com
Tulsa, OK 74104

Designer, fabricator, finisher & installer of ornamental metalwork: railings, gates, fences, lighting, pergolas & gazebos, furnishings, fixtures, grilles, doors, arbors, hardware & more; cast & wrought aluminum, iron, steel, bronze, brass & stainless alloys; CAD services; NOMMA's most award-winning metal fabricator; national market.
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Wiemann Ironworks designed and fabricated this gate.

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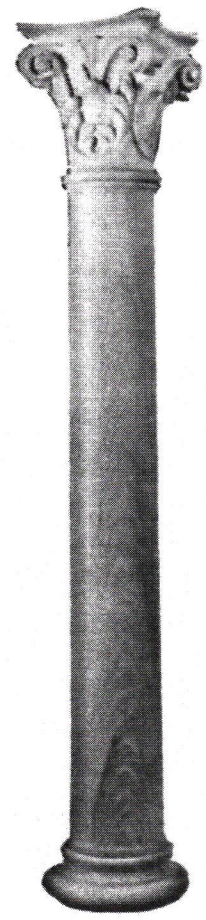

Woodline offers plain and fluted columns made of oak, alder and poplar.

Woodline Co.
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www.woodlineusa.com
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Manufacturer of hand- & machine-carved architectural wood elements: corbels, balusters, newel posts, columns, mantels, moldings, porch parts, capitals & rosettes; oak, poplar & alder in stock, all other species available; columns up to 30 in. in dia. & 22 ft. long.
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Woolen Mill Fan Co.
717-382-4754; Fax: Same as phone
www.architecturalfans.com
New Park, PA 17352

Supplier of belt-driven ceiling fans: some built from patterns in Smithsonian exhibit; 10 models use solid-iron, -bronze & -mahogany blades; hand crafted by old-order Amish; assembled to specifications at PA studio.
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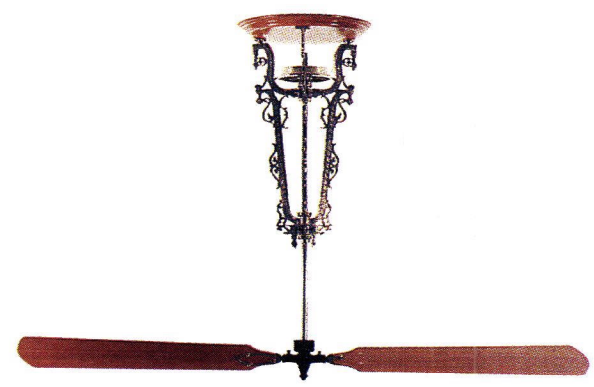

This ornate ceiling fan, the Peacock from Woolen Mill Fan Co., features solid-mahogany blades.

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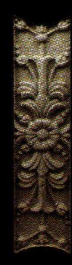
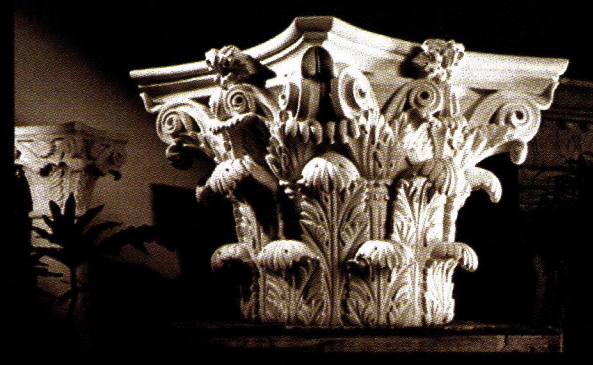

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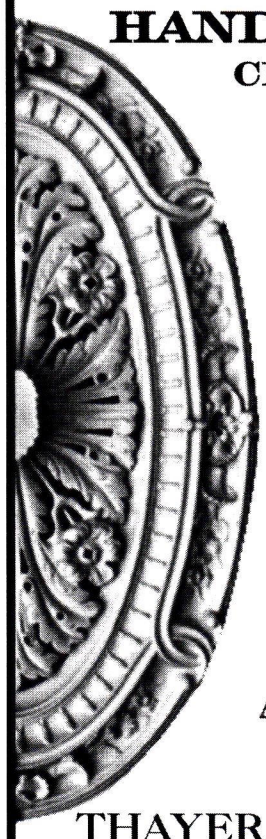

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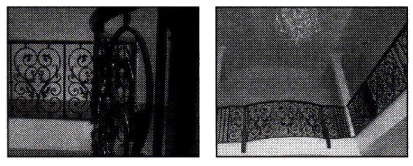

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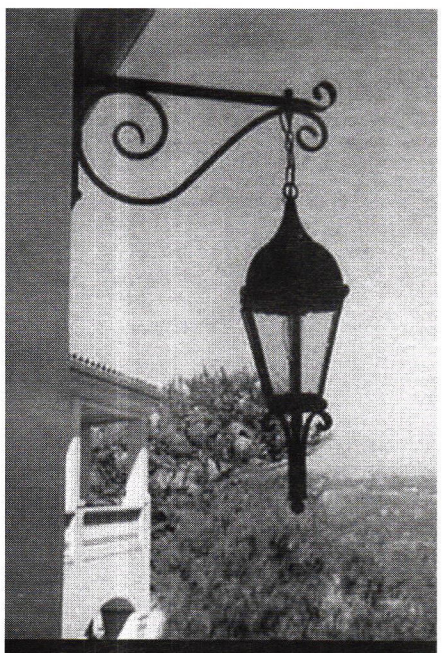

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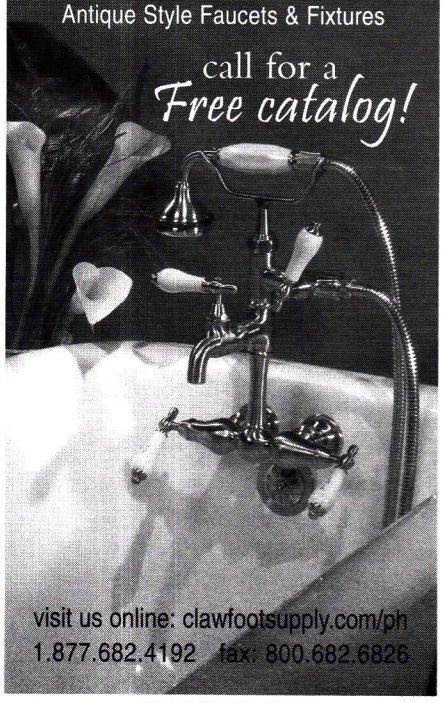

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{ "The White House of the land of not go rotten. Look away, look away, cotton now has a porch that will look away..." (well, you know the rest.) }

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{White House of the Confederacy ~ Richmond, Virginia}

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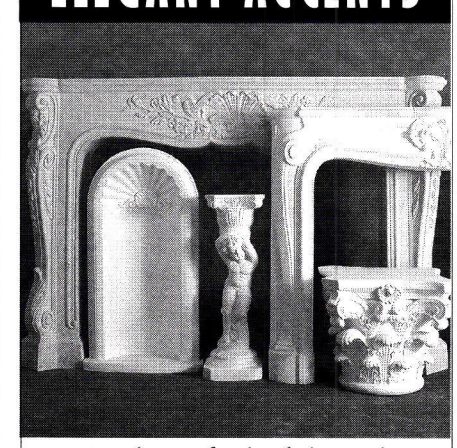

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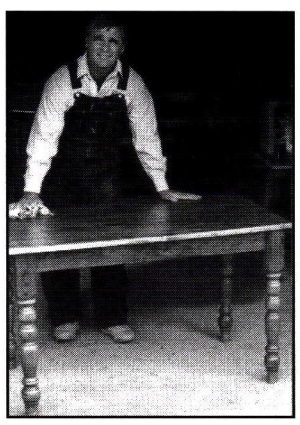

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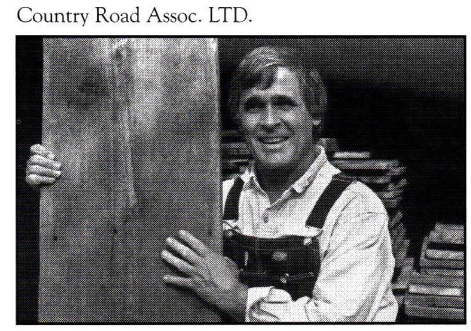

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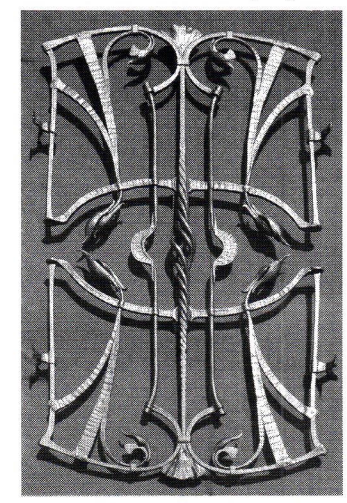

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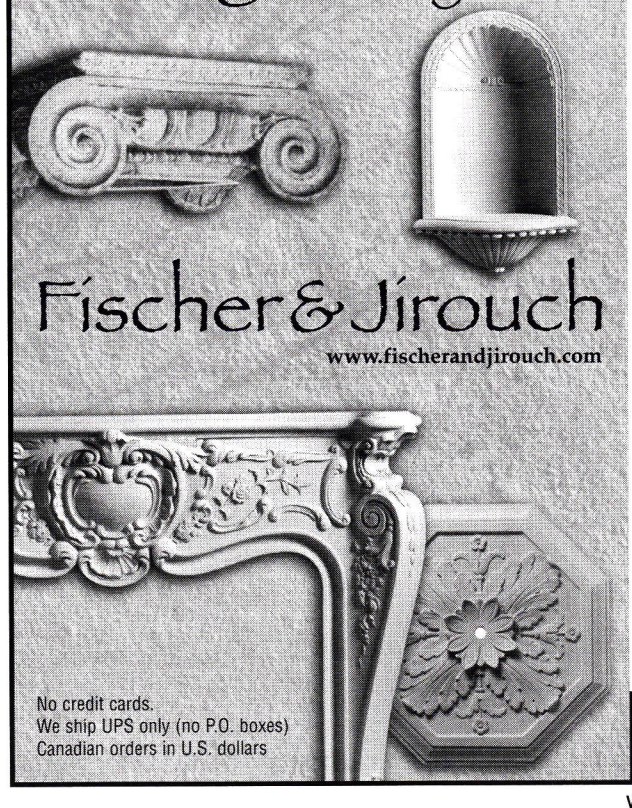

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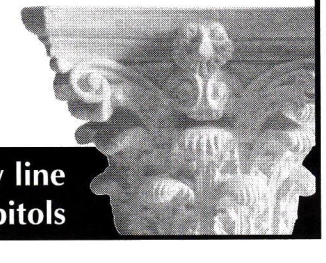

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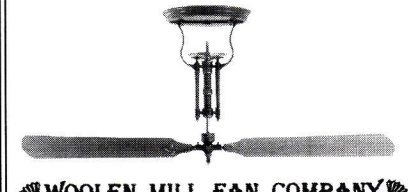

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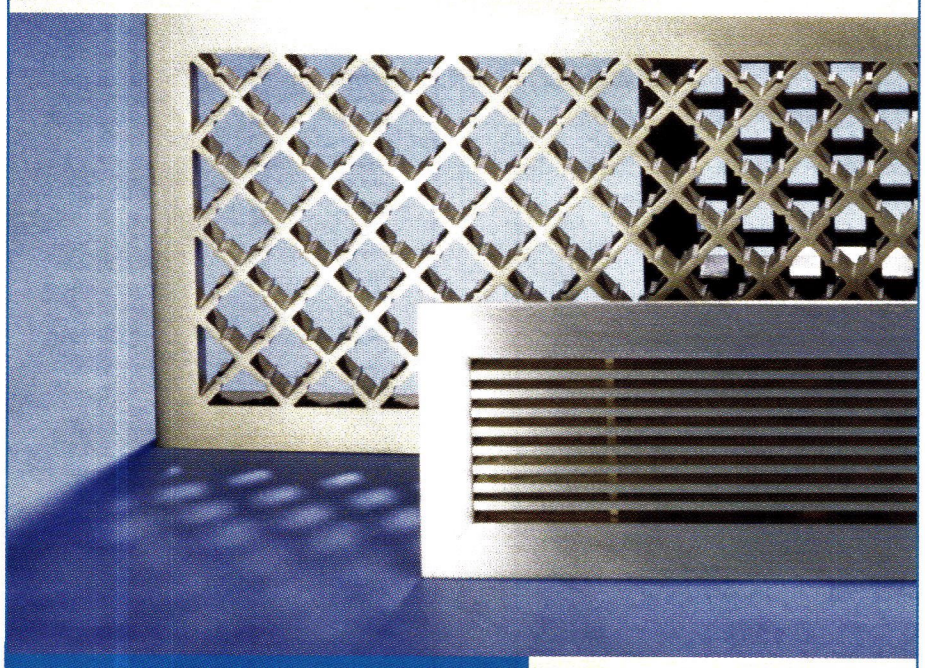

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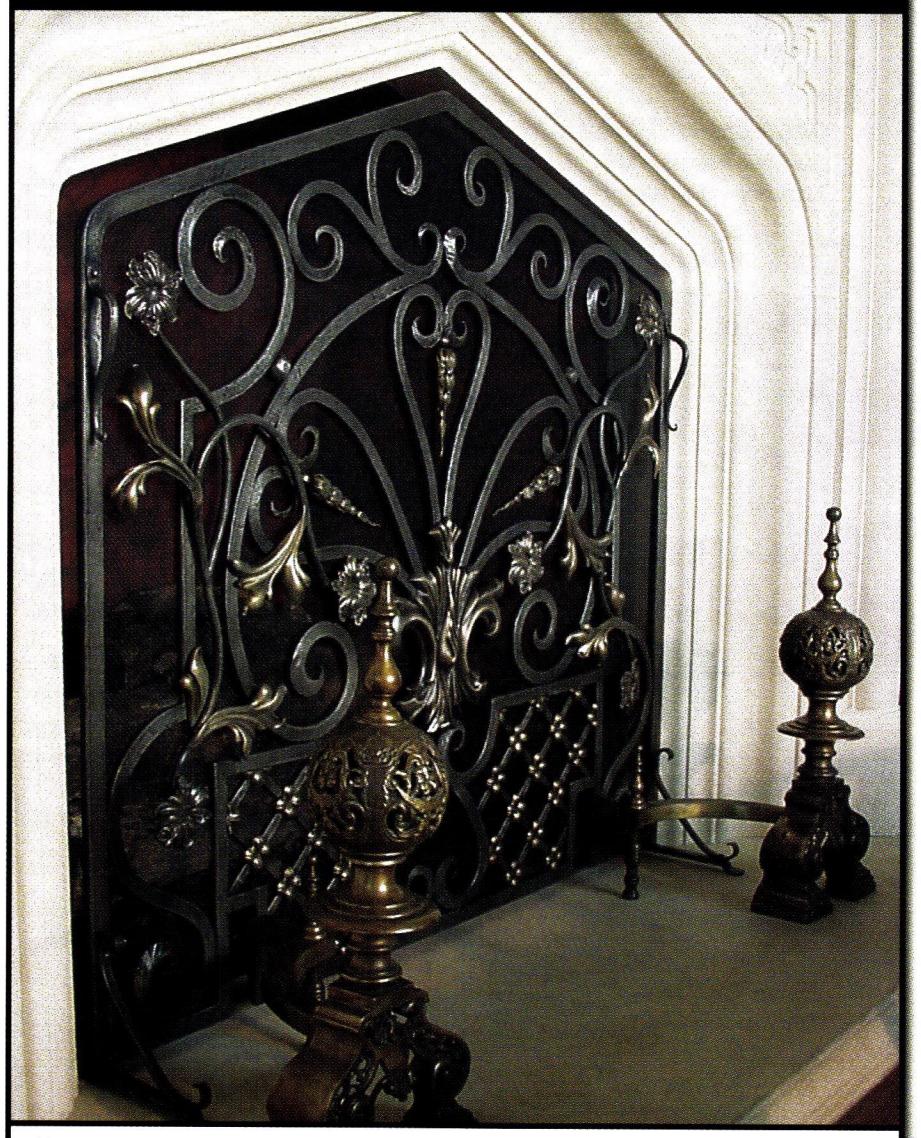

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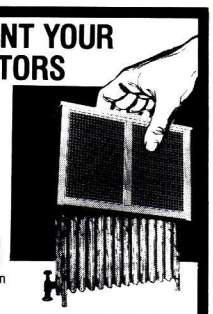

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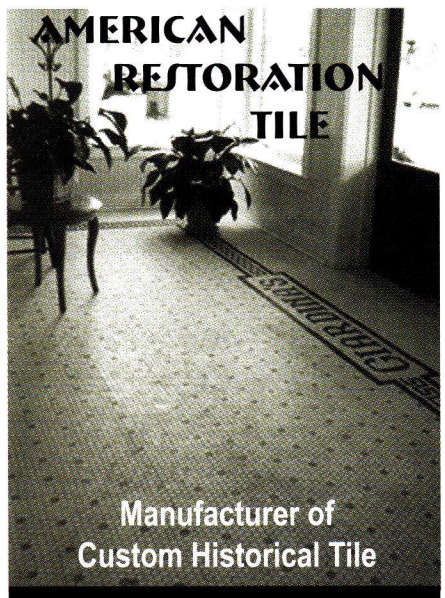

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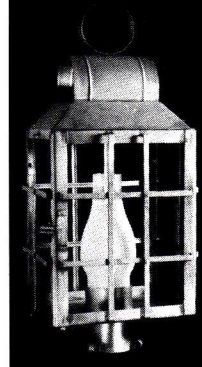

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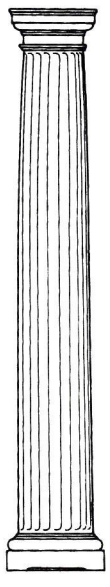

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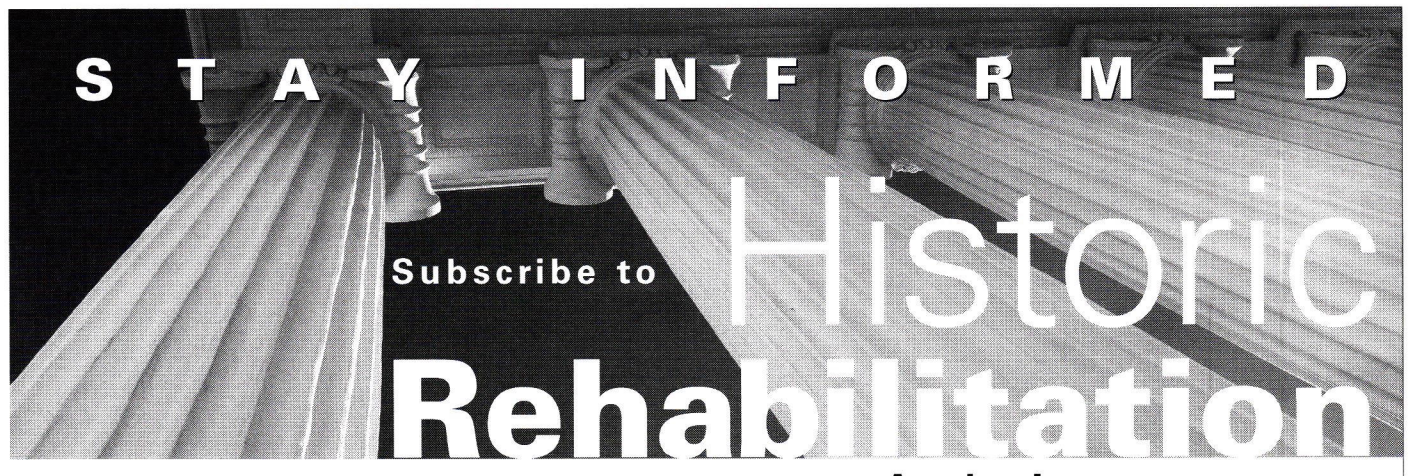

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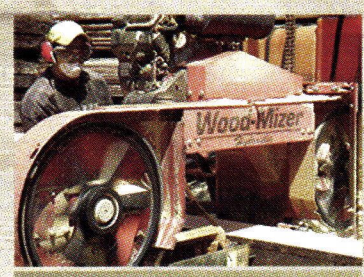

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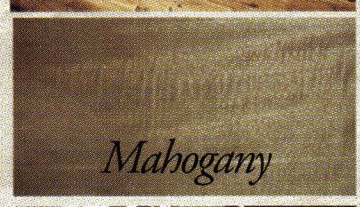

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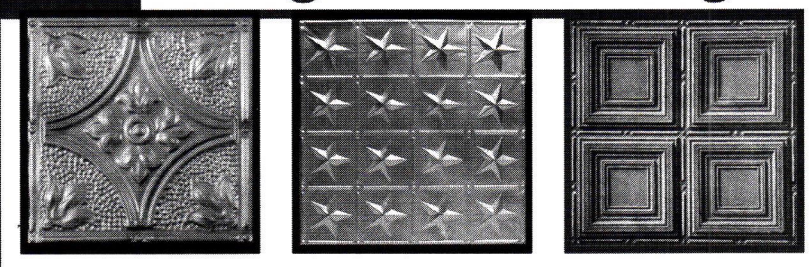

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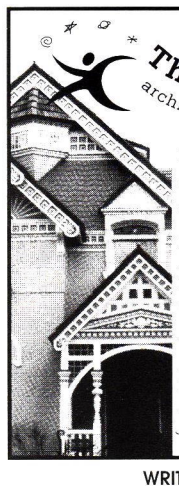

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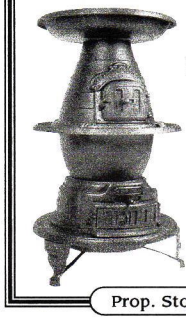

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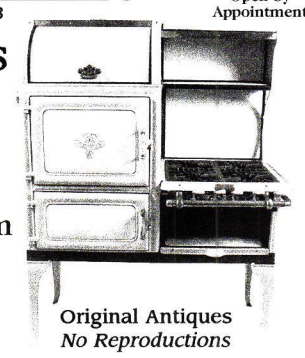

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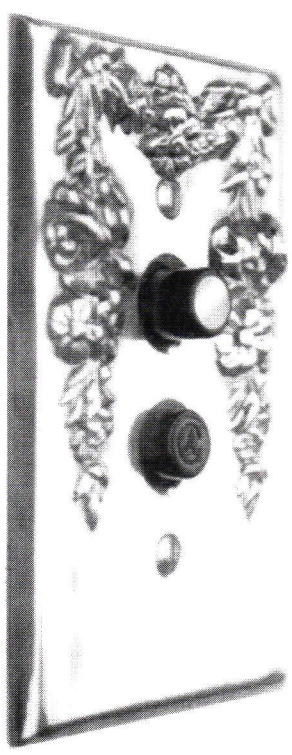

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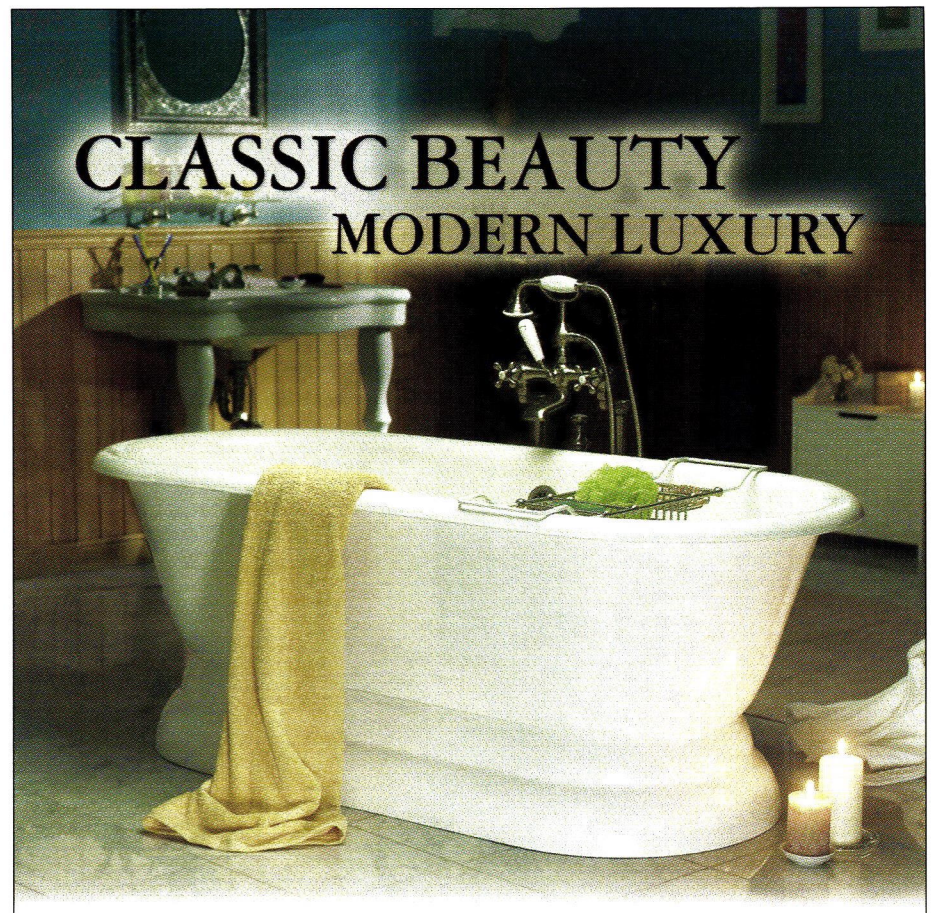

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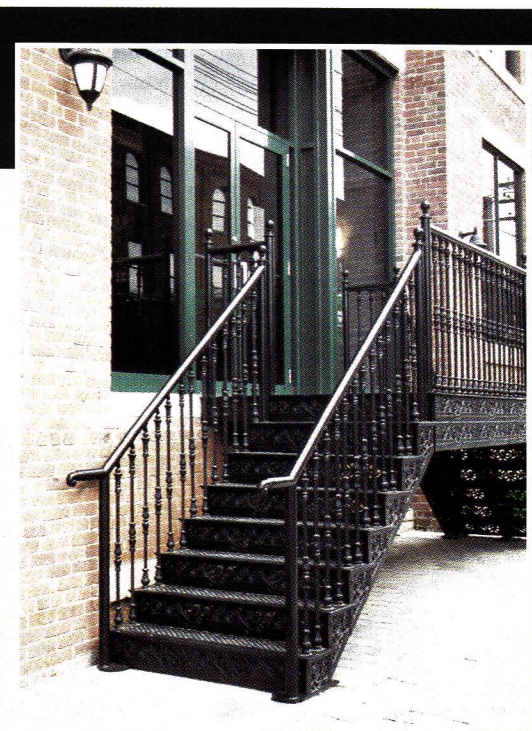

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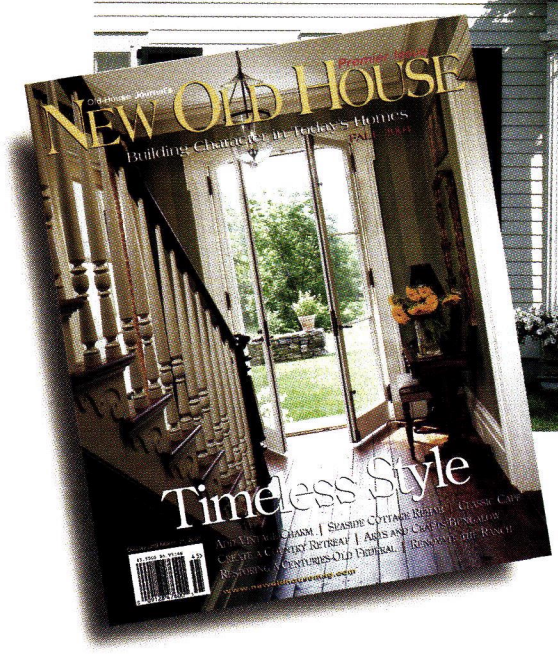

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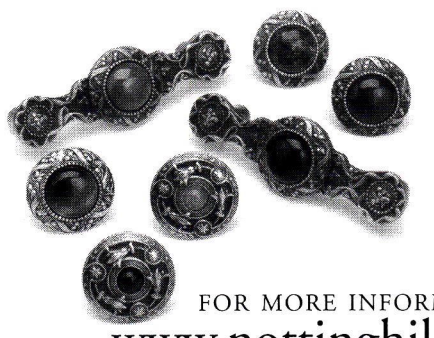

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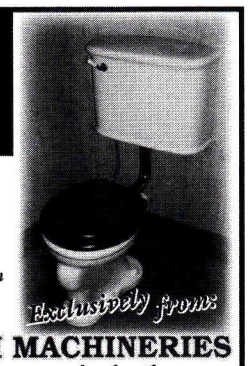

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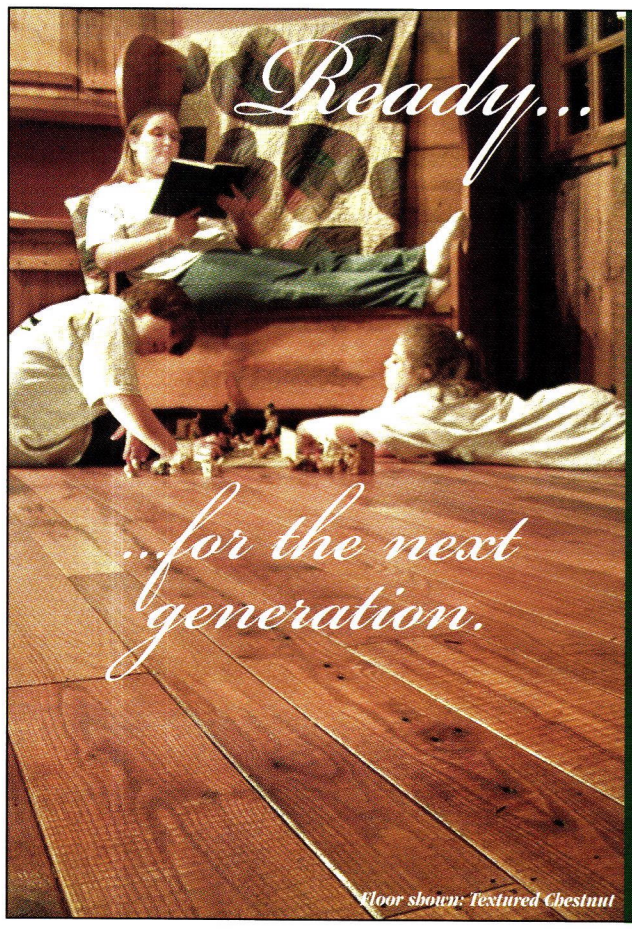

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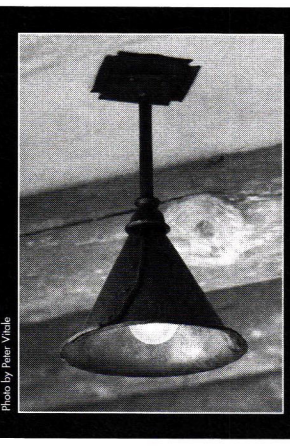

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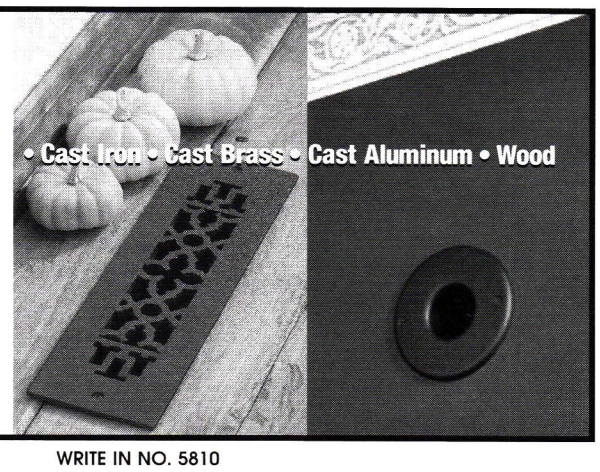

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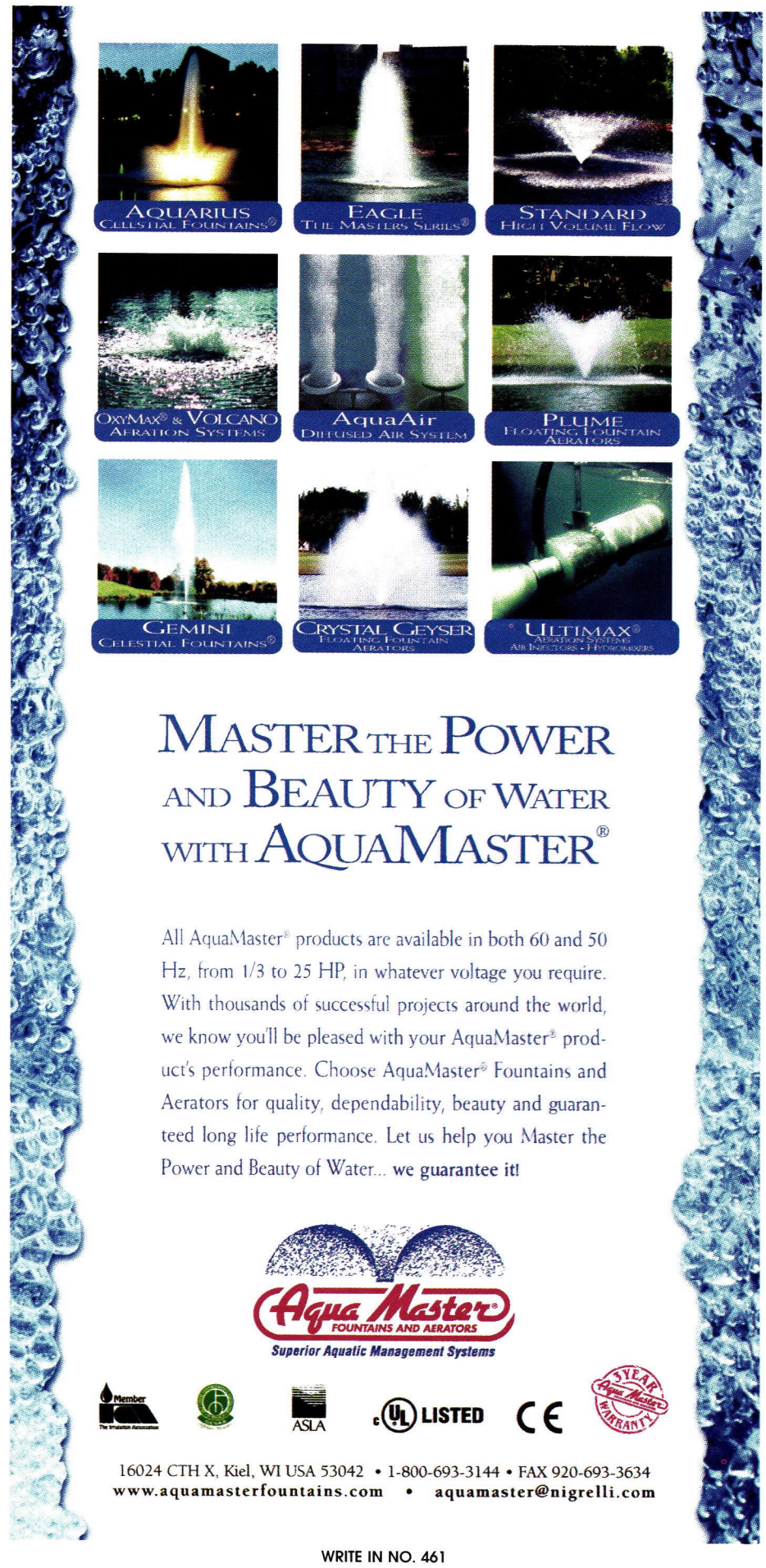

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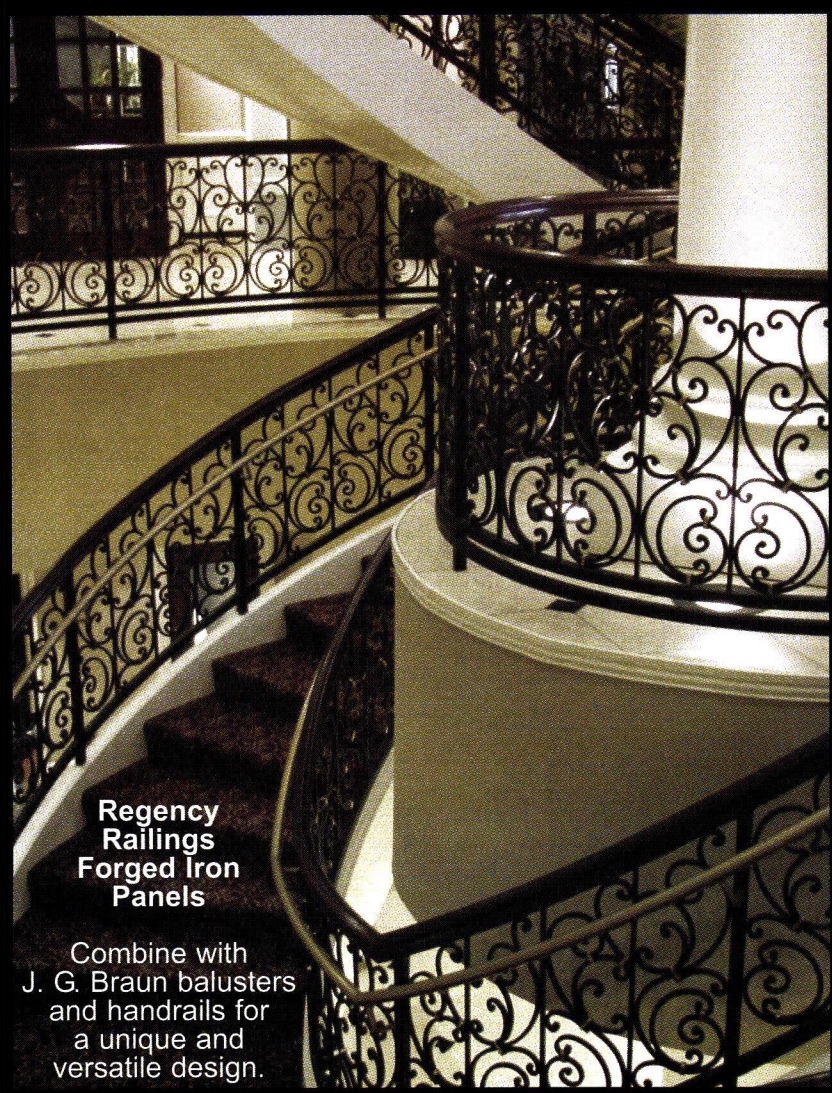

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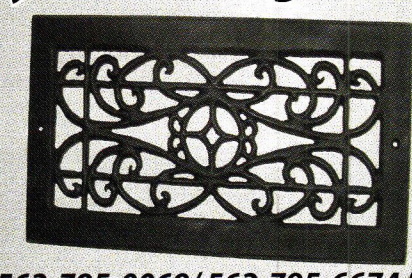

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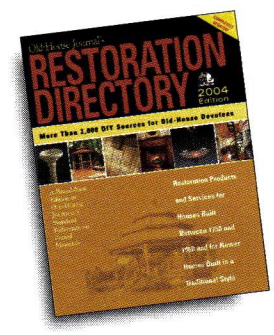

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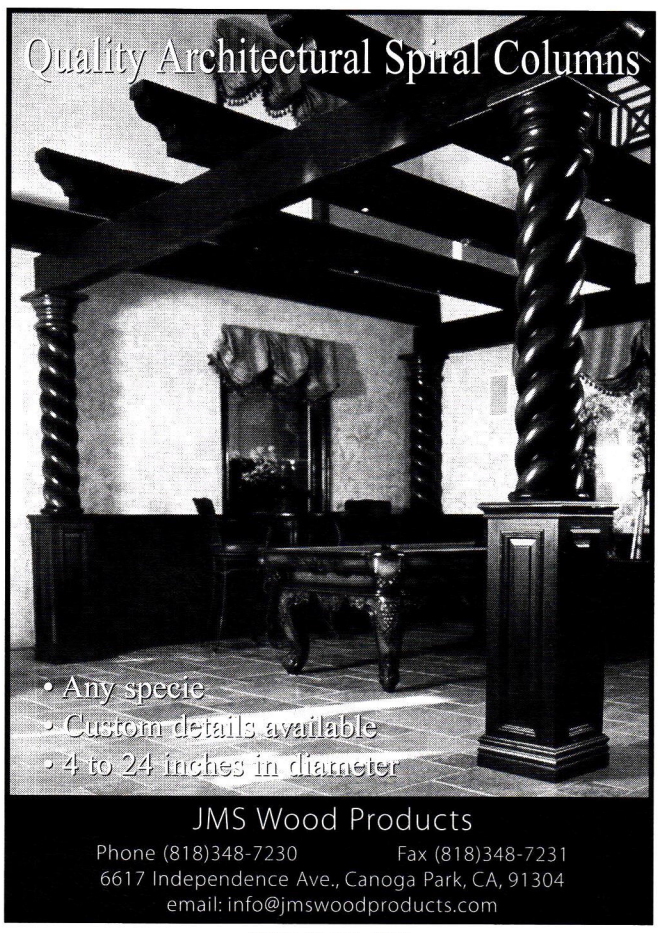

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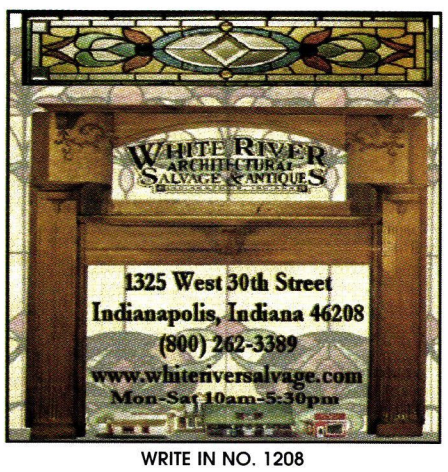

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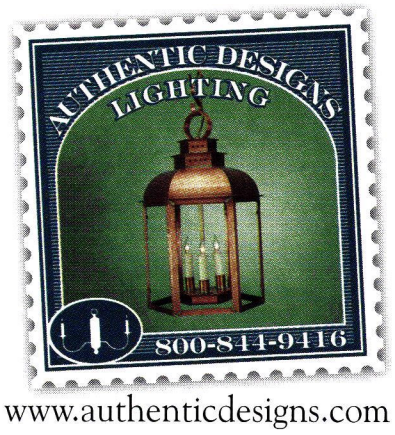

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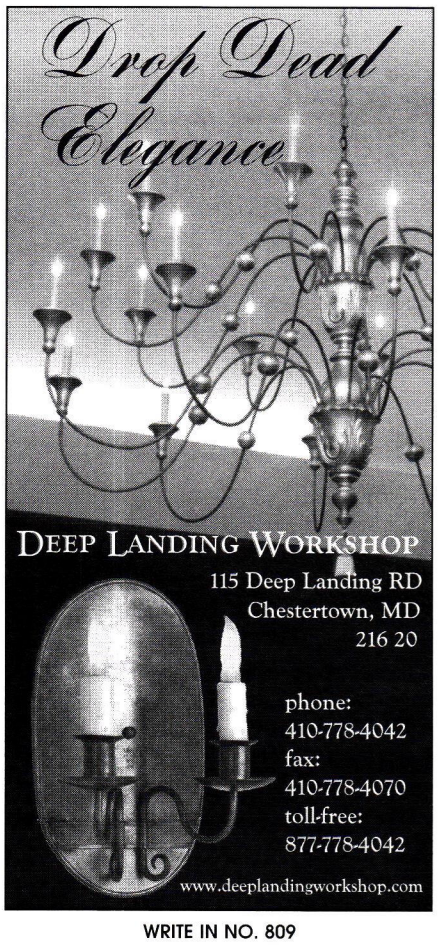

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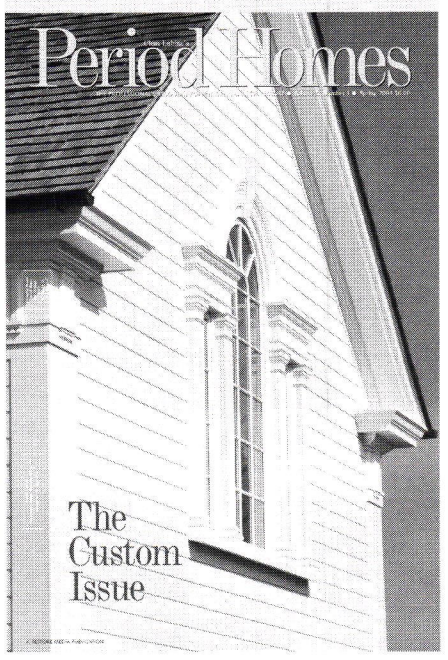

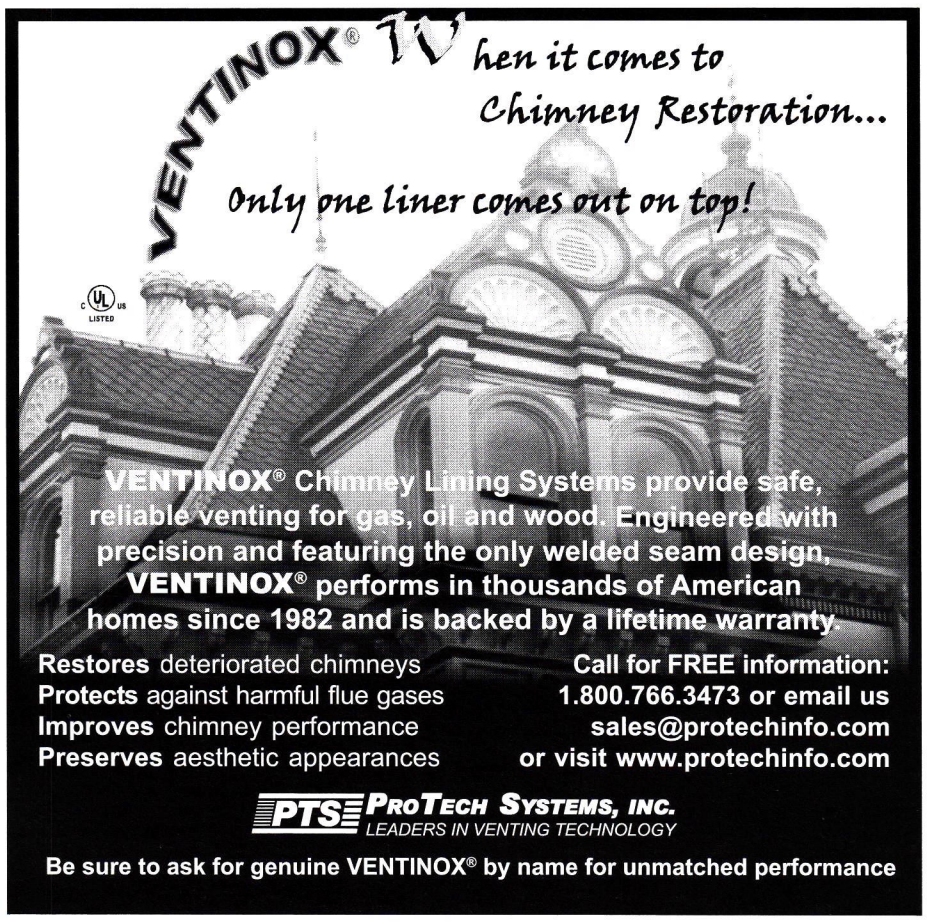

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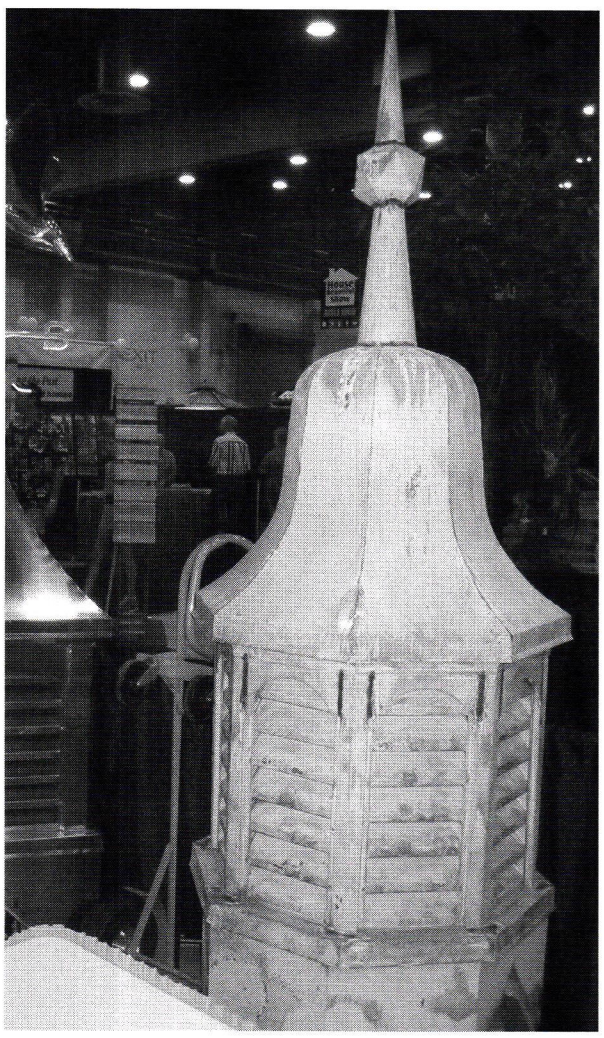

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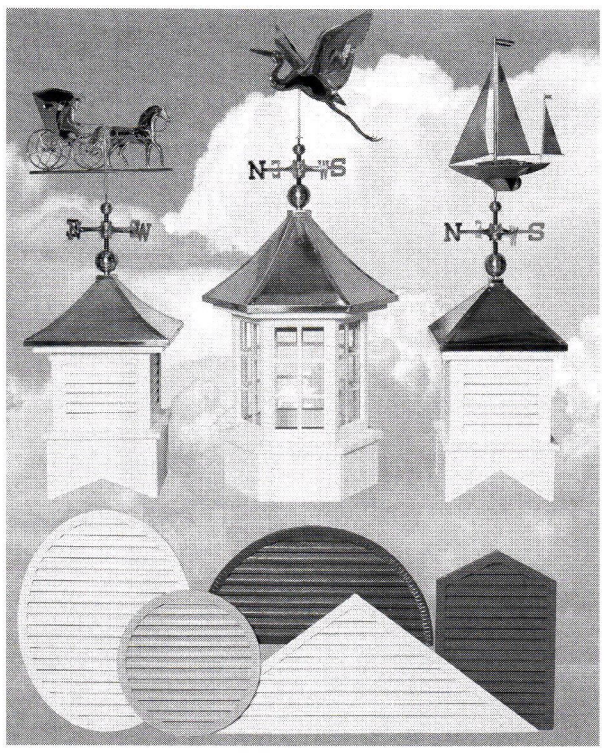

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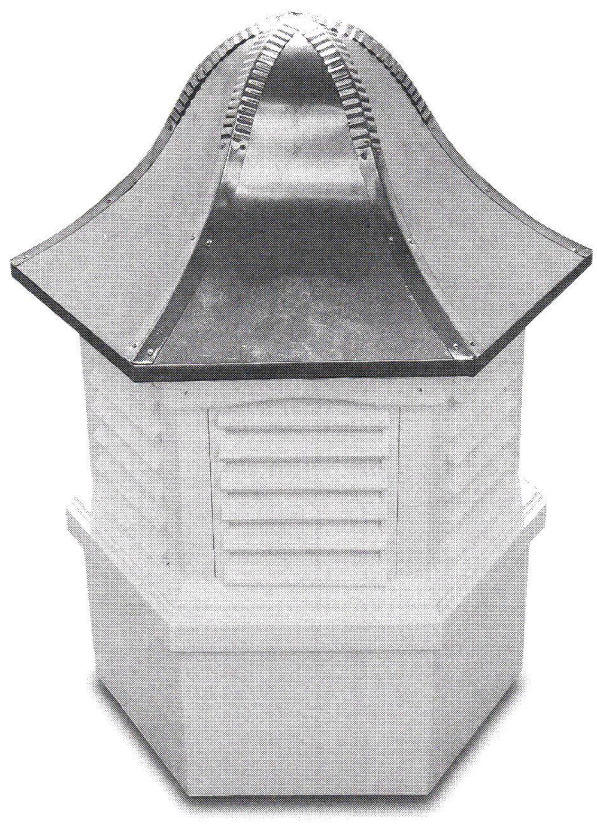

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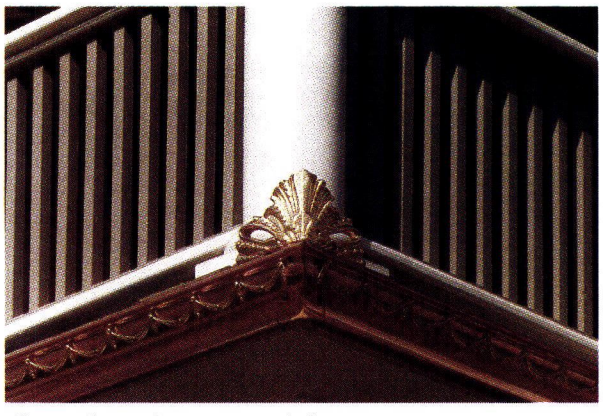

Classic Gutter Systems created this ornate gutter, incorporating a hidden nut-and-bolt adjustable hanger system.

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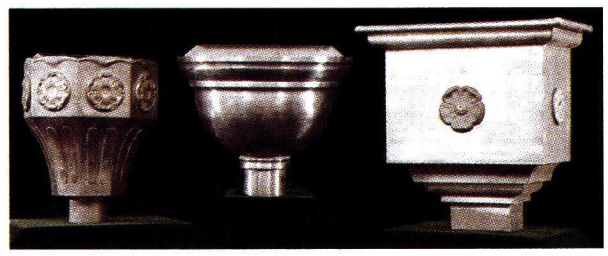

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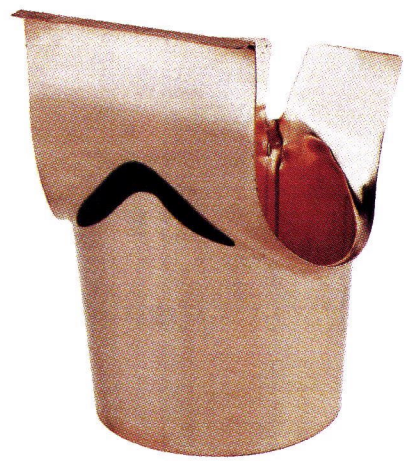

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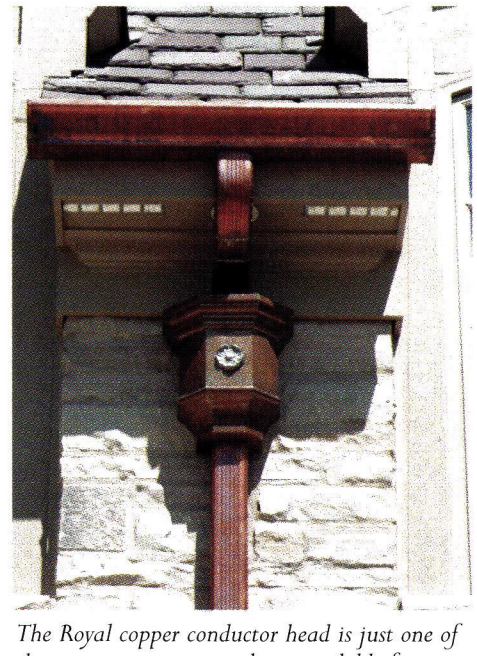

The Royal copper conductor head is just one of the numerous gutter products available from Rain Trade.

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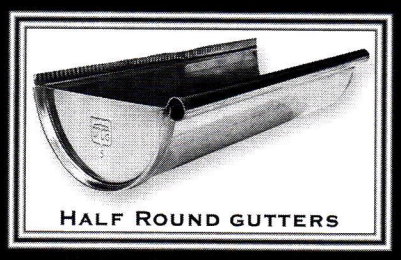

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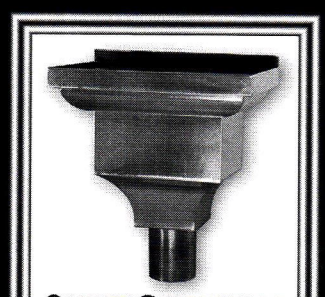

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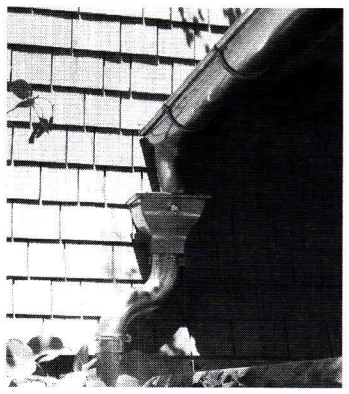

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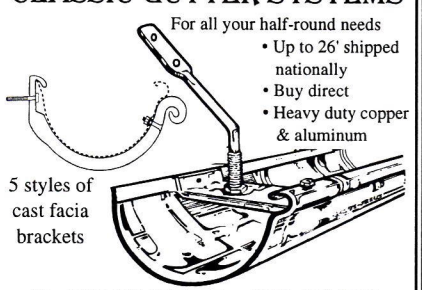

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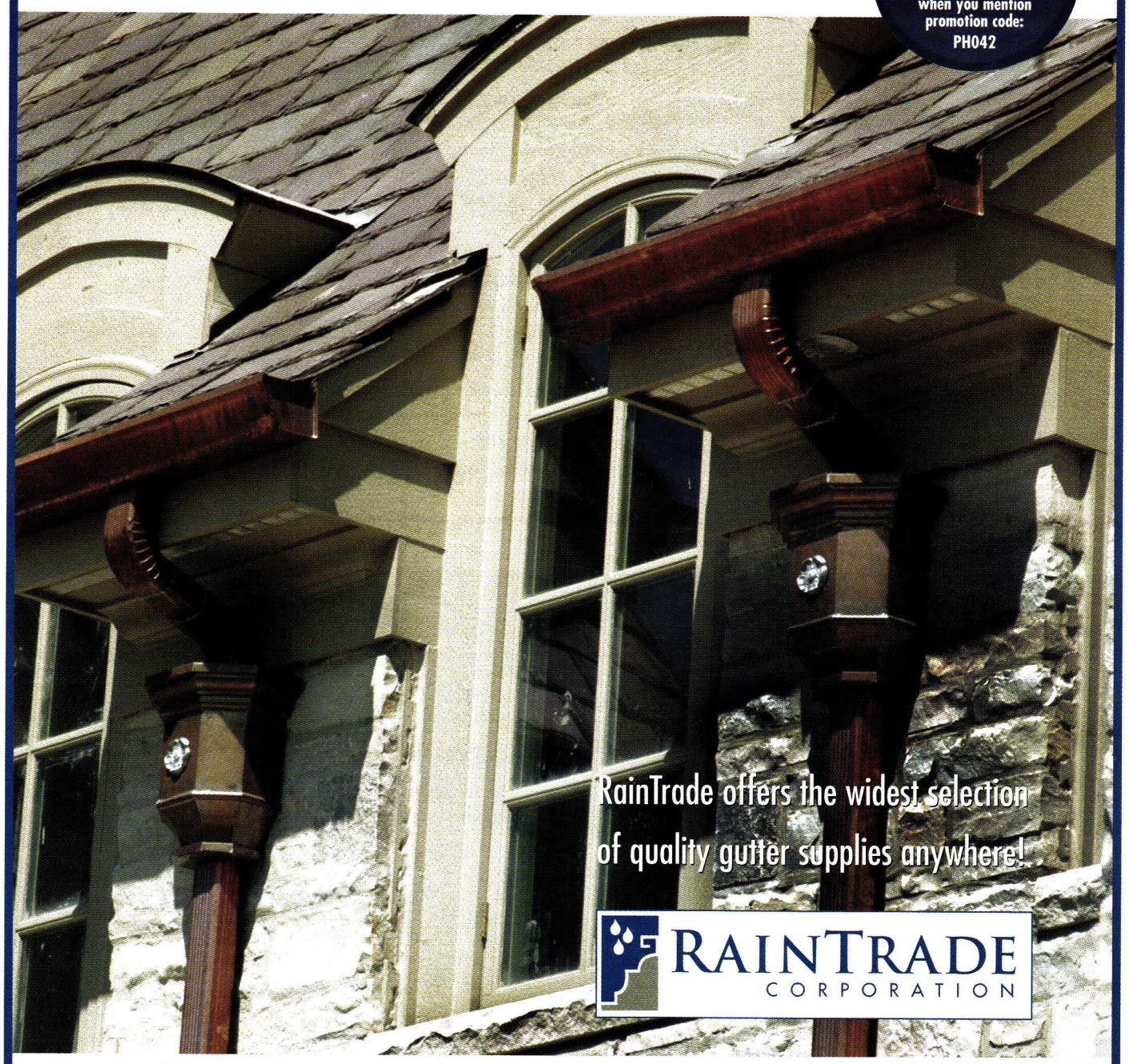

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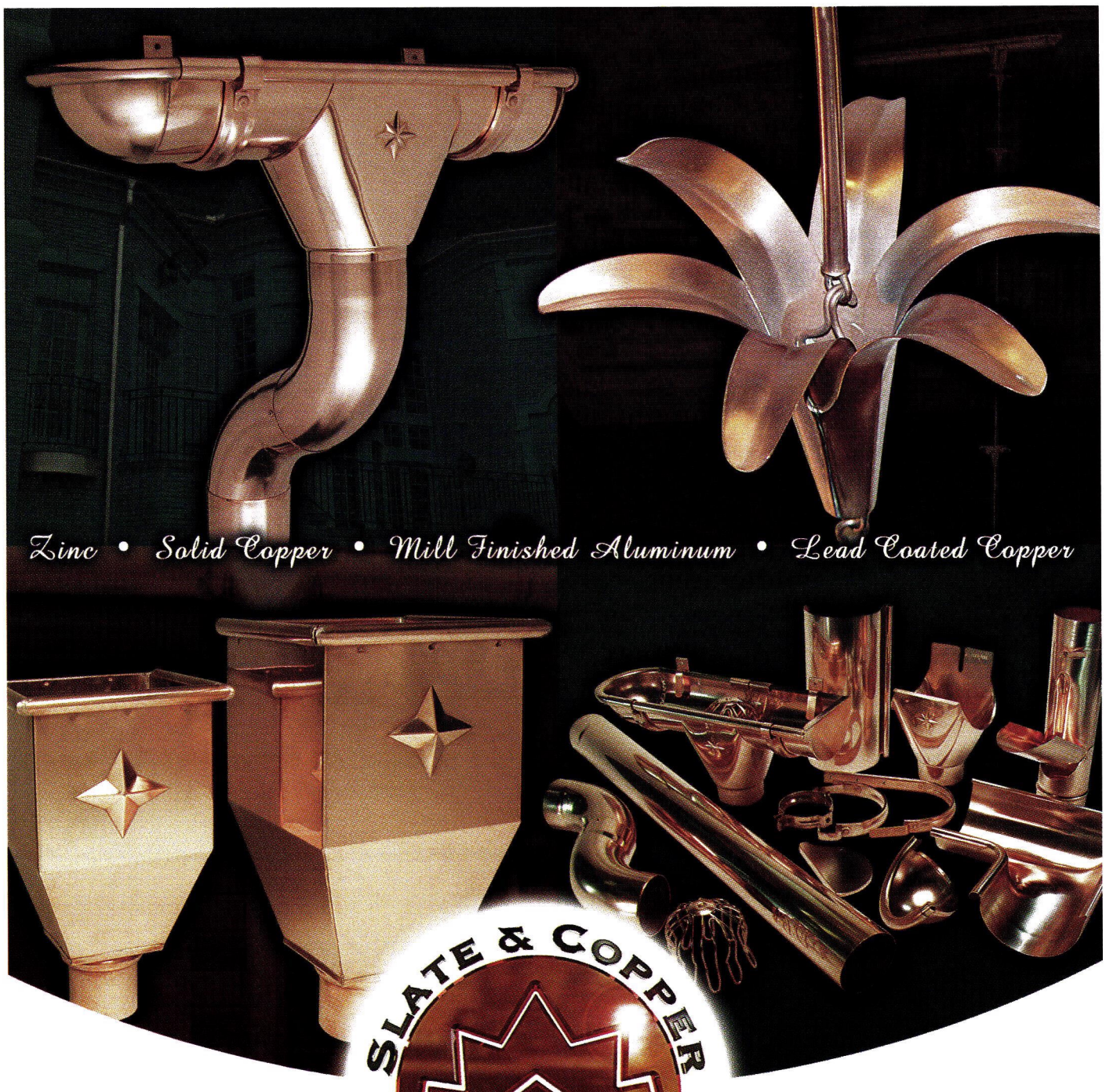
Weather Guard manufactured the copper leader boxes and gutter system on this building.



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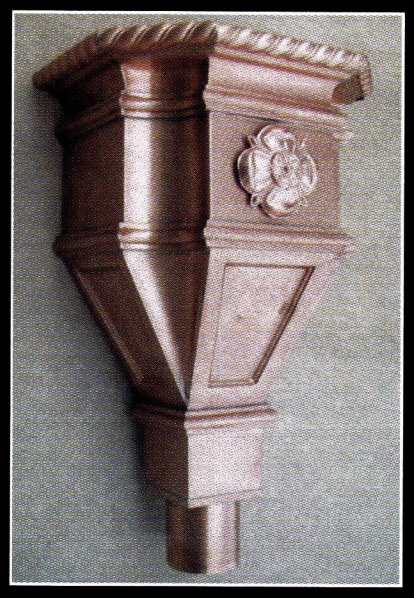

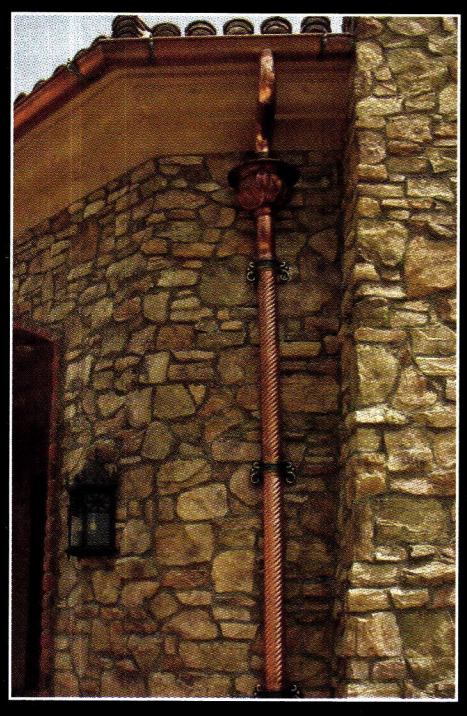

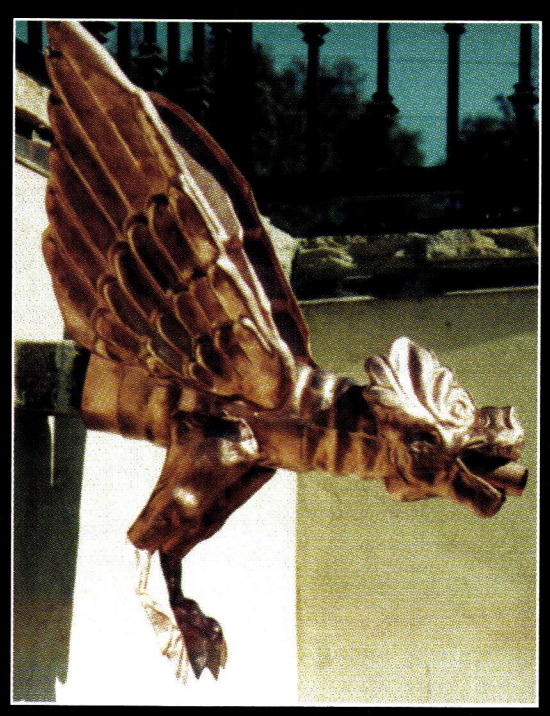

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Glass House, LLC, custom fabricated this dodecagon skylight with a window beneath each section.

Glass House, LLC

800-222-3065; Fax: 860-974-1173
www.glasshouseusa.com
Pomfret Center, CT 06259

Custom fabricator & manufacturer of conservatories, greenhouses, sunrooms, pool enclosures, garden houses, roof lanterns, specialty skylights & glass roof systems: wood & aluminum; ornamental metalwork & copper-clad options; numerous glazing options; variable trim enhancements & accessories.
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The double-tiered glass lantern roof by Oak Leaf provides the final touch to this conservatory and adjoining potting shed.

Renaissance Conservatories

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This aluminum skylight was designed by Solar Innovations.

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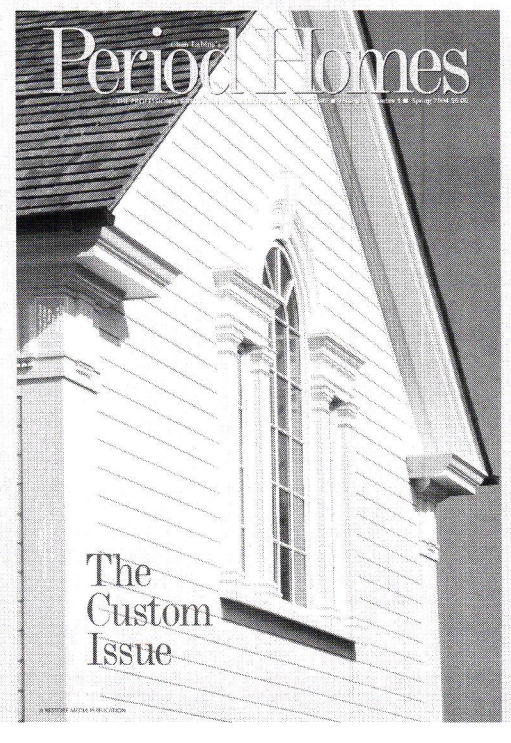

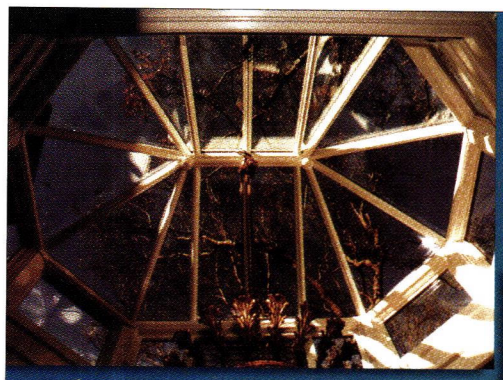

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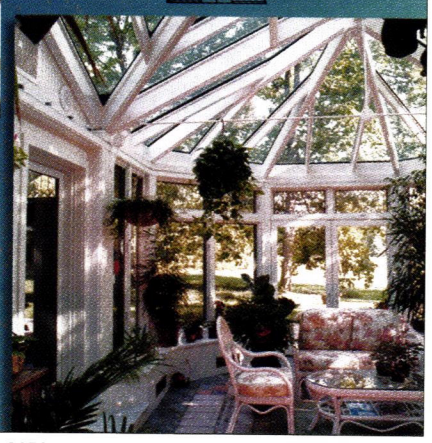

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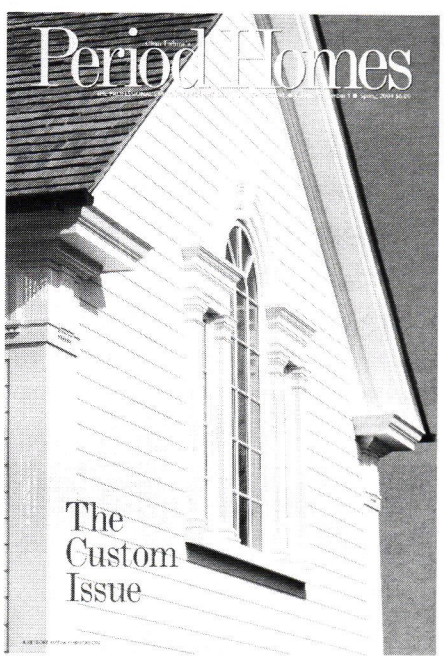

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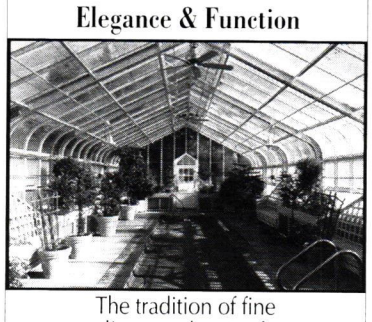

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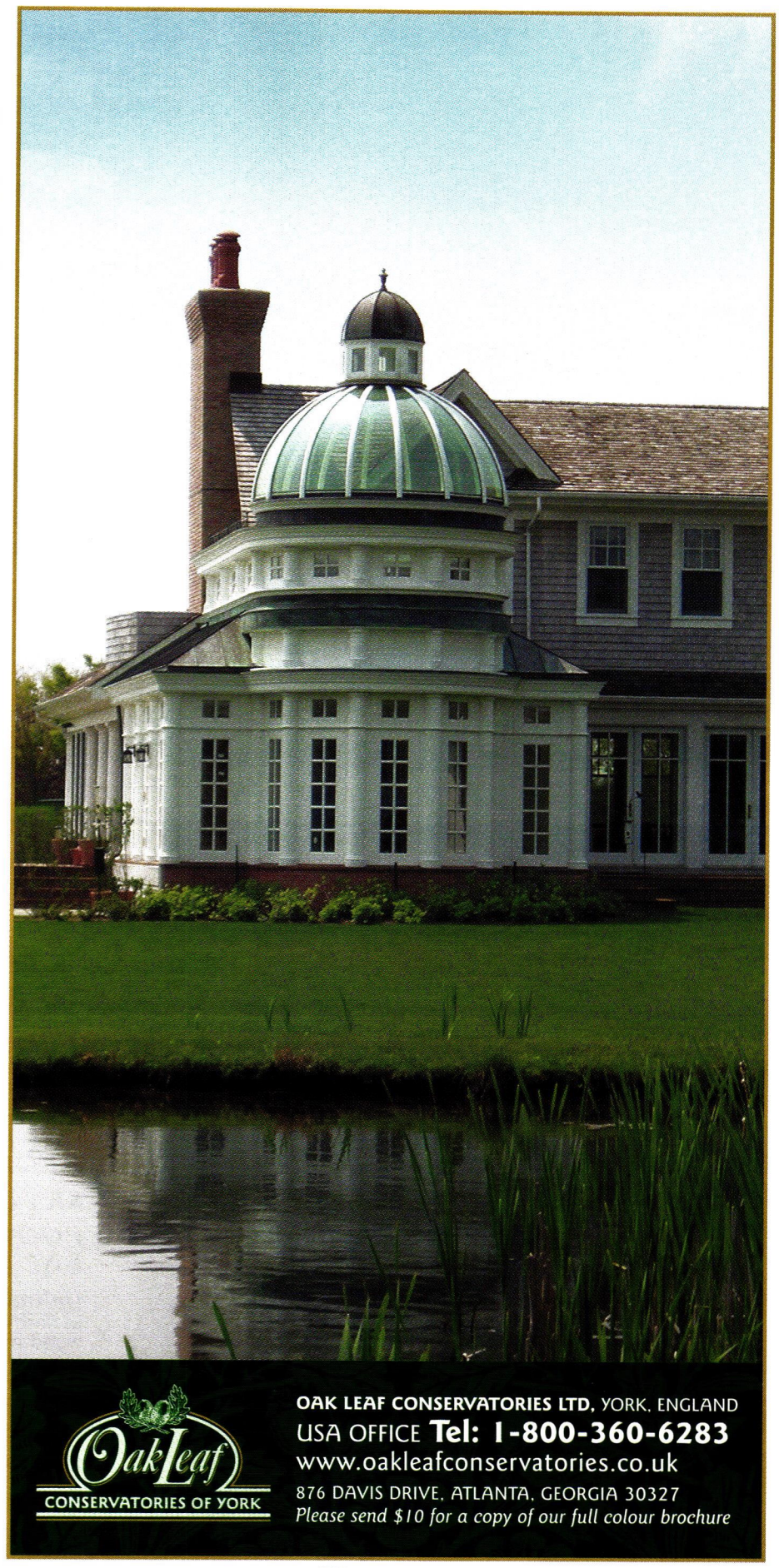

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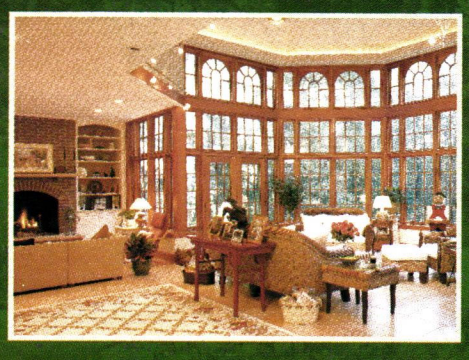

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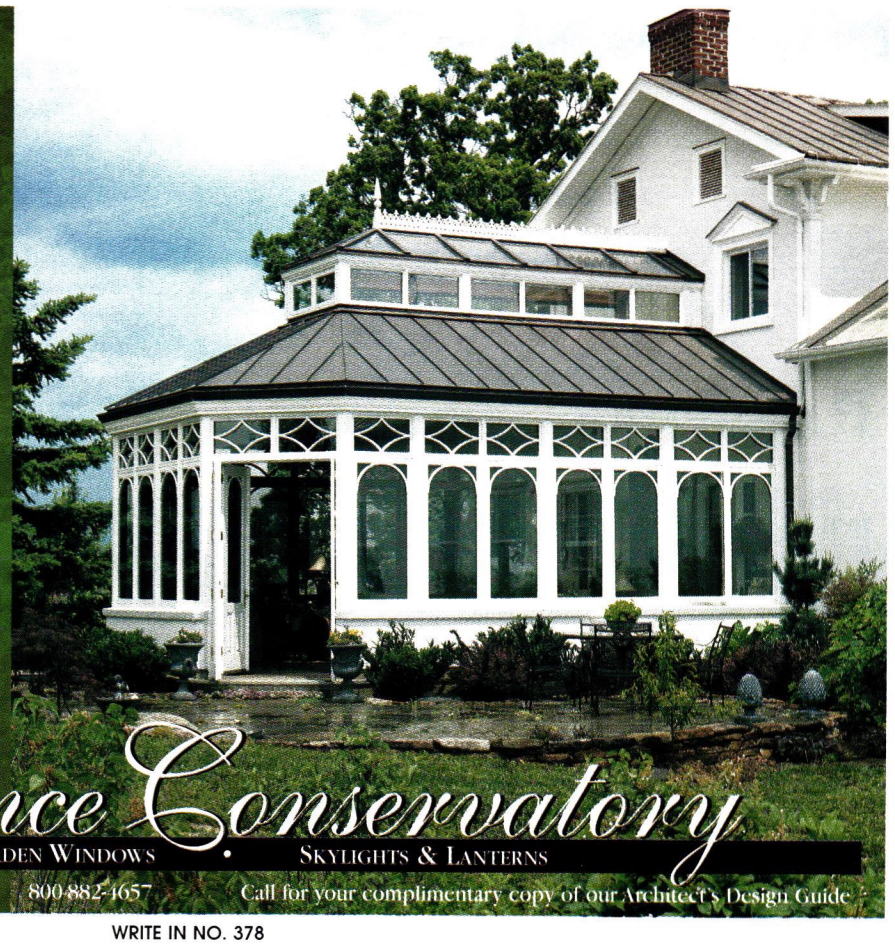

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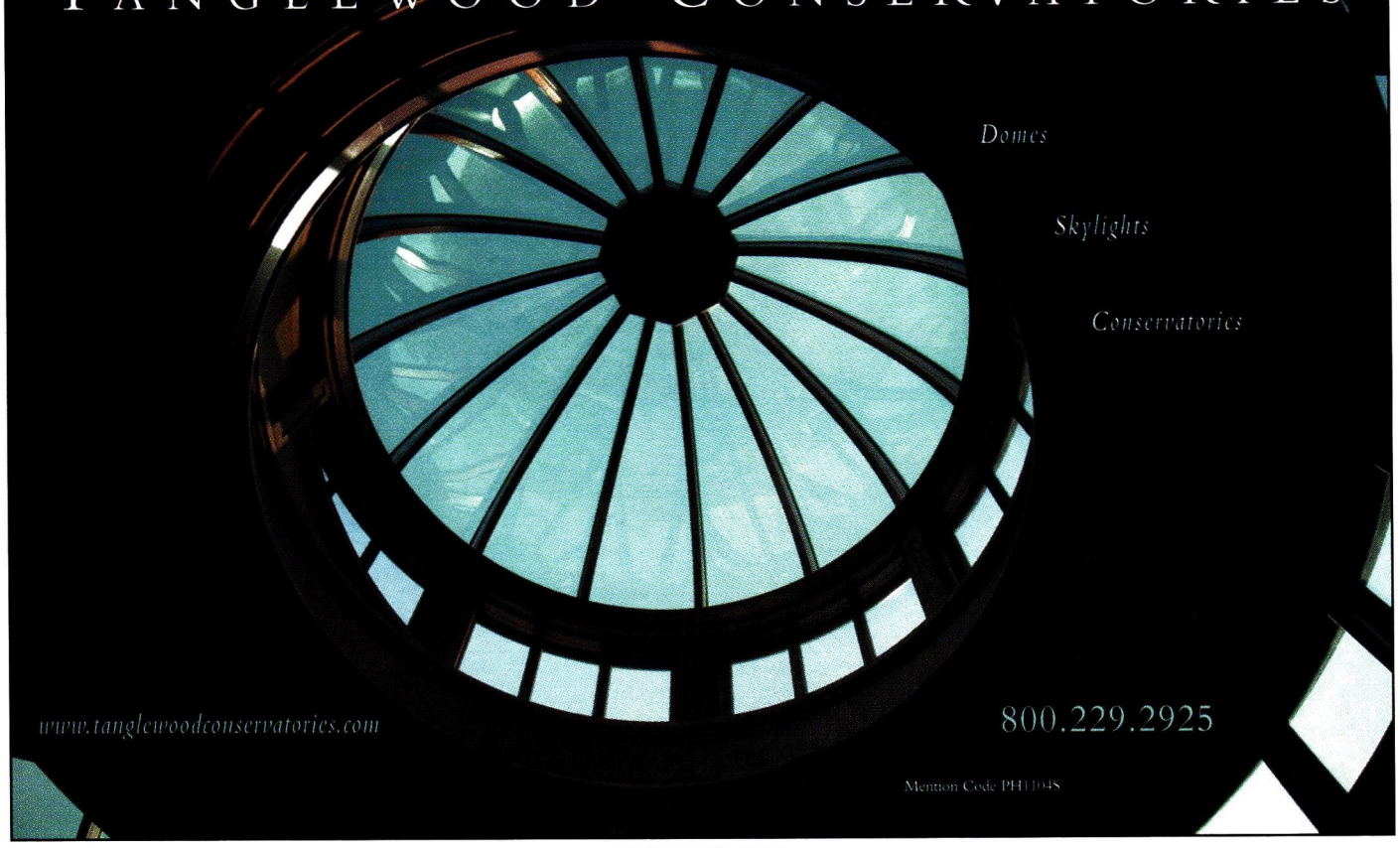

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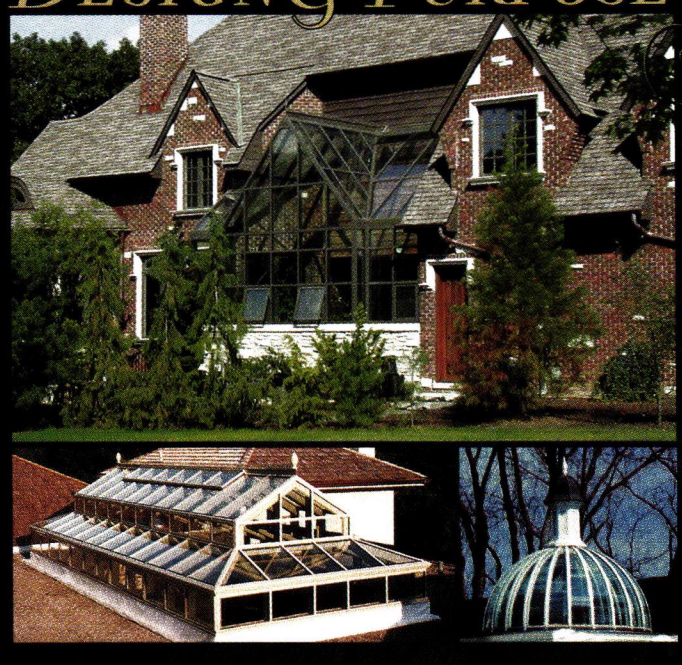

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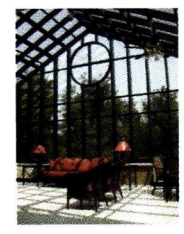

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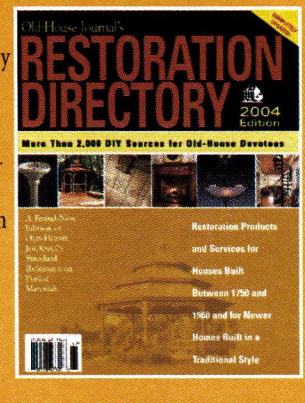

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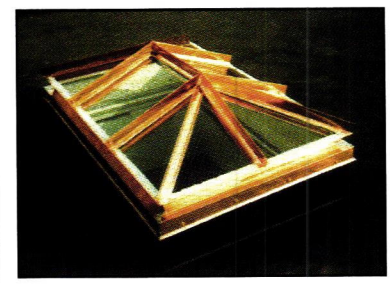

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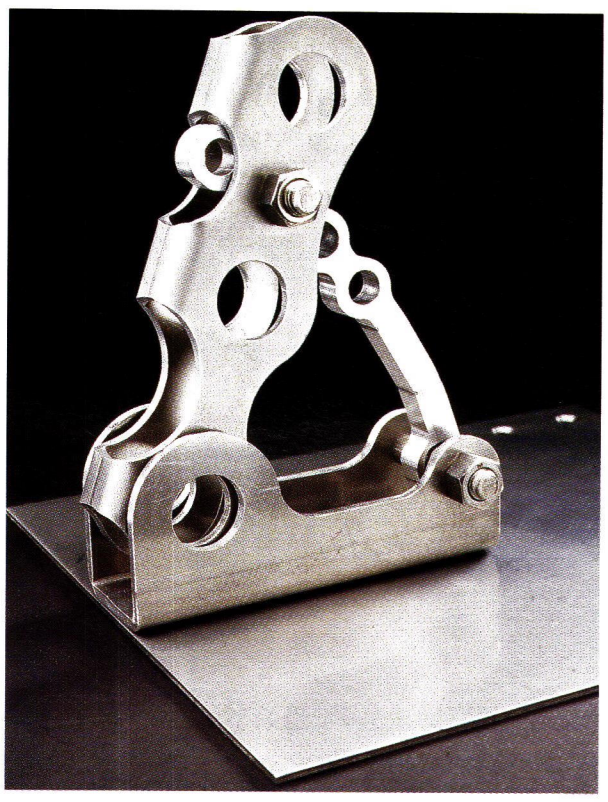
Weathervanes, Finials & Snowguards



Model #225 from Alpine SnowGuards is a three-pipe snowguard.

Alpine SnowGuards

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Manufacturer & distributor of pad- & pipe-style snowguards: commercial, institutional, industrial & residential; recommended layouts are available upon request at no cost or obligation.
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Feasterville, PA 19053

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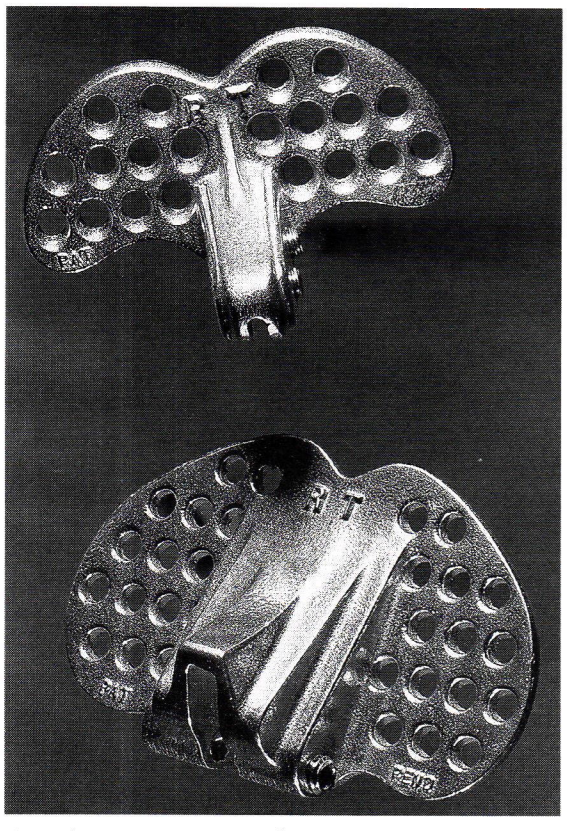

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Copper House, The

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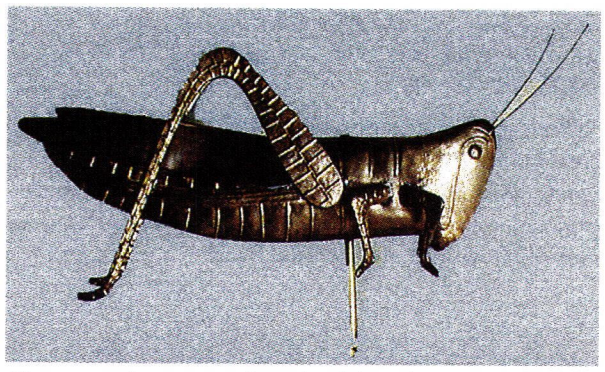

Unique weathervanes, such as this 34-in.-long grasshopper, are available from the Copper House in copper, verdigris and gold-leaf finishes.

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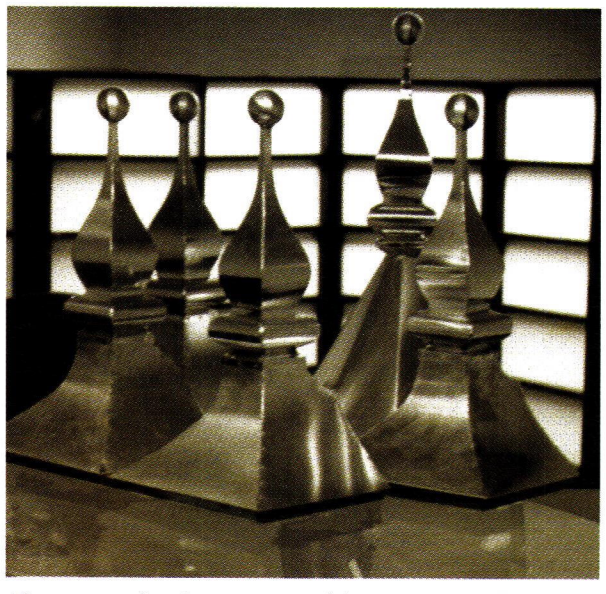
www.copper-inc.com
Dickinson, TX 77539

Manufacturer & distributor of hand-crafted copper ridge caps, cupolas, finials, dormer-style roof vents, gable-end vents, gutter systems, chimney caps & pots, weathervanes, copper finishing products & more: custom; copper & lead-coated copper; online catalog.
Write in No. 1312

CopperCraft, Inc.

800-486-2723; Fax: 817-490-9661
www.coppercraft.com
Keller, TX 76248

Fabricator of architectural sheetmetal using traditional metalworking skills & modern technology: spires, finials, weathervanes, dormers, cupolas, conductor heads, cornices, custom gutters, metal roofing, cladding, chimney caps & more; copper & lead-coated copper.
Write in No. 1490



These copper finials were custom fabricated by Durable Slate from 20-oz. sheets for a historic residence in Columbus, OH.

Durable Slate Co., The

800-666-7445; Fax: 614-299-7100
www.durableslate.com
Columbus, OH 43201

Custom fabricator & sheetmetal structures: weathervanes, finials, cupolas, domes, cornices, cresting & other ornamental details.
Write in No. 3720

EJMcopper Inc.

407-447-0074; Fax: 407-447-0075
www.ejmcopper.com
Orlando, FL 32804

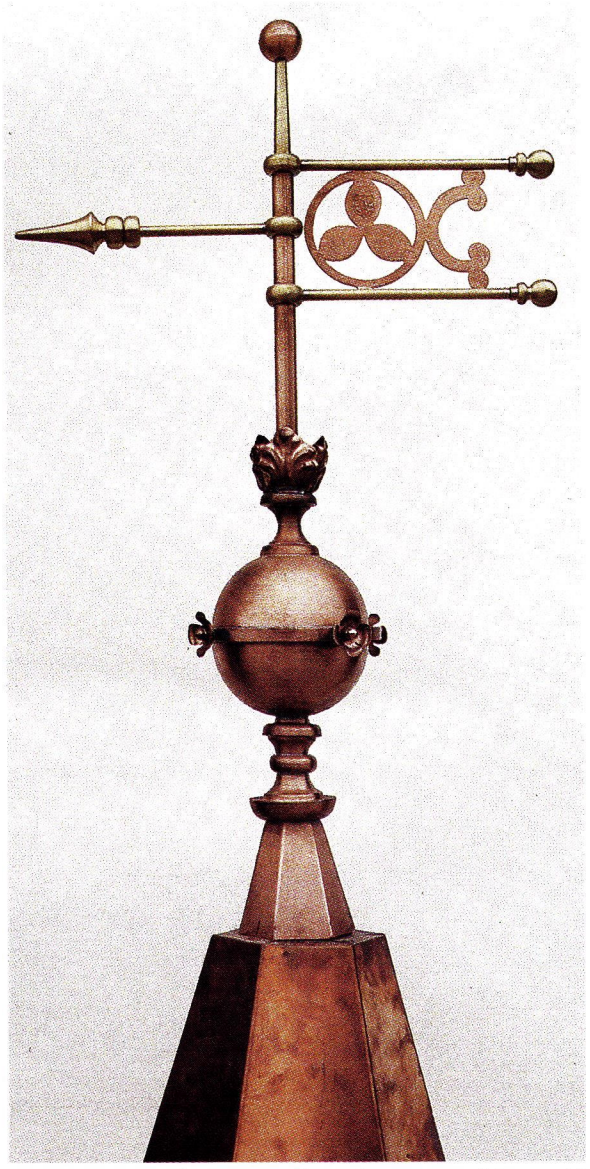
Manufacturer of custom architectural copper elements: hand-crafted copper post-mounted barrel-style mailboxes, chimney caps, cupolas, finials, spires, dormer vents, leader heads, louvers, weathervanes & more; online catalog.
Write in No. 588

This ball and spike finial was fashioned by the craftspeople at EJMcopper.

Follansbee Steel

800-624-6906; Fax: 304-527-1269
www.follansbeeroofing.com
Follansbee, WV 26037

Manufacturer of metal roofing products: Terne II, a zinc/tin-coated carbon steel & TCS II, a zinc/tin-coated stainless steel; snowguards.
Write in No. 1289



This approximately 40-in.-tall weathervane was fabricated by Hans Liebscher in heavy copper with solid tubes.

Hans Liebscher Custom Copper Works & Sheet Metal, Inc.

760-471-5114; No fax
www.hansliebschercopperwks.com
San Marcos, CA 92079

Fabricator of copper sheetmetal ornament & roofing: horizontal-radius curved gutters, stampings, gargoyles, leader heads, weathervanes, finials, ornamental twisted downspouts, cast-brass gutter hardware & smooth downspout elbows; reproductions of historic metal ornament from original pictures or drawings.
Write in No. 189

Historical Arts & Casting, Inc.

800-225-1414; Fax: 801-280-2493
www.historicalarts.com
West Jordan, UT 84088

Designer & custom fabricator of ornamental metalwork: skylights, doors, windows & window repair, columns & capitals, cornices, newels, balusters, planters, finials, sculpture, fountains, copper kitchen hoods, plaques & signage, grilles, lighting, lattice, brackets, spandrels, custom turnings, domes, canopies & more; cast iron, bronze, aluminum & wrought iron/steel; Arts & Crafts, Victorian & other styles; restoration services.
Write in No. 1210

Historical Arts & Casting handles all levels of work on its custom metalwork projects, from estimating and design to fabricating and installation.

Kayne & Son Custom Hardware, Inc.

828-667-8868; Fax: 828-665-8303
www.customforgedhardware.com
Candler, NC 28715

Custom fabricator of hardware: functional & dummy, straight or curved strap hinges, various designs of HL hinges, cane & drop surface bolts, locks & locksets, custom butt hinges, knockers & sash locks; gate, cabinet, bathroom & shutter hardware; fireplace grates, tools & accessories; weathervanes; hand-forged & cast-bronze thumb-latch sets, dummy handles & pulls; hand-forged steel, wrought iron/steel & cast brass/bronze; repair, custom restoration & reproduction; brochure $5.
Call for more information

King Architectural Metals

800-542-2379; Fax: 800-948-5558
www.kingmetals.com
Dallas, TX 75228

Wholesale supplier of ornamental & architectural metal components for wrought-iron staircases, handrails, gates, fences, balustrades, furniture, mailboxes, doors, screens, awnings & fireplace screens; cast-iron, aluminum & plastic finials.

M.J. Mullane manufactures snowguards in bronze with eagle, fleur de lis and oak-leaf patterns.

M.J. Mullane Co., Inc.

978-568-0597; Fax: 978-568-9227
www.bronzeguard.com
Hudson, MA 01749

Manufacturer of snowguards for all roof types: bronze & copper; historically accurate guards for restoration work; cast-bronze pipe rail brackets for fence-type snow-retention systems.
Write in No. 560

New Concept Louvers

800-635-6448; Fax: 801-489-0606
www.newconceptlouvers.com
Springville, UT 84663

Manufacturer of PVC-coated, aluminum or vinyl cupolas: stock or custom; full-bodied & silhouette weathervanes in a variety of sizes & shapes; louvers, dormer vents, finials & spires.
Write in No. 1264

This country doctor weathervane is a stock item available from New Concept Louvers.

NIKO fabricated this custom copper finial.

NIKO Contracting Co.

412-687-1517; Fax: 412-687-7969
www.nikocontracting.com
Pittsburgh, PA 15213

Nationwide contractor, fabricator & installer of architectural sheetmetal & roofing: historical restoration projects; slate, tile, metal & other historical roofing; ornamental ceilings, cresting, finials, cornices, cupolas, domes & steeples; snowguards; copper, lead-coated copper, zinc, galvanized steel, stainless steel, aluminum, brass & terne-coated metals.
Write in No. 8300

Northern Roof Tile Sales Co.

888-678-6866; Fax: 905-689-7099
www.northernrooftiles.com
Dundas, ON, Canada L9H 7K6

Importer of hand-crafted clay roofing tile from a select group of tile makers: variety of sizes, shapes & color blends; Mediterranean, French country & old-world English styles; slate & slate substitutes; cresting, finials, snowguards & chimney pots.
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Outhouse, The

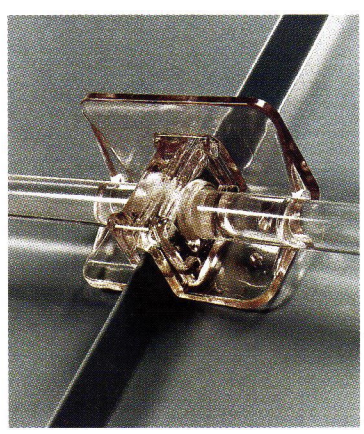
800-346-7678; Fax: 717-687-9730
www.outhousepa.com
Ronks, PA 17572

Supplier of weathervanes: more than 100 in stock; copper, aluminum & steel; custom silhouettes; handmade cupolas.
Write in No. 1299

Polar Blox, Inc.

800-298-4328; Fax: 814-629-9090
www.polarblox.com
Hollsopple, PA 15935

Manufacturer of UV-stabilized polycarbonate snowguards: adhesive- or screw-mount; clear or in an array of standard or custom colors.
Write in No. 1296



Polar Blox offers a variety of snowguards, including this polycarbonate model for standing-seam roofs.

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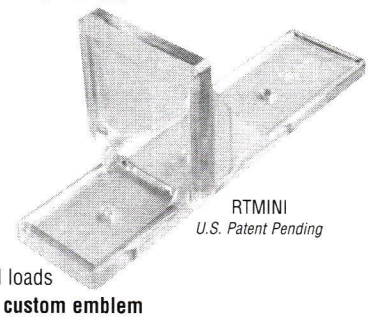
Now Introducing - "The MINI"

- Premium quality **high clarity polycarbonate plastic**
- **Economical value** with maximum protection
- Low visibility to blend with roof materials
- **UV stabilized for strength and longevity**
- 1.5" wide base to fit parapet ribbed roof channels
- 4.5 square inch holding area
- 2:1 base to blade ratio
- **Attachment with adhesive, screws, or VHB Tape**
- 3 cored screw holes for mechanical attachment
- Engineered design to resist torsional loads and lateral loads
- **Blade "Snowflake" slot accepts metal color chip or custom emblem**



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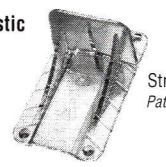
U.S. Patent Pending

Surface Mount & Structural Rib Clear Snow Guards

RTCLSM
Surface Mount
Pat.# 6,266,929

- Premium **crystal clear polycarbonate plastic**
- Low visibility to blend with roof materials
- **UV stabilized for strength and longevity**
- 3:1 base to blade ratio
- **Attachment with adhesive or screws**



RTCLSR
Structural Rib
Pat.# 6,266,929

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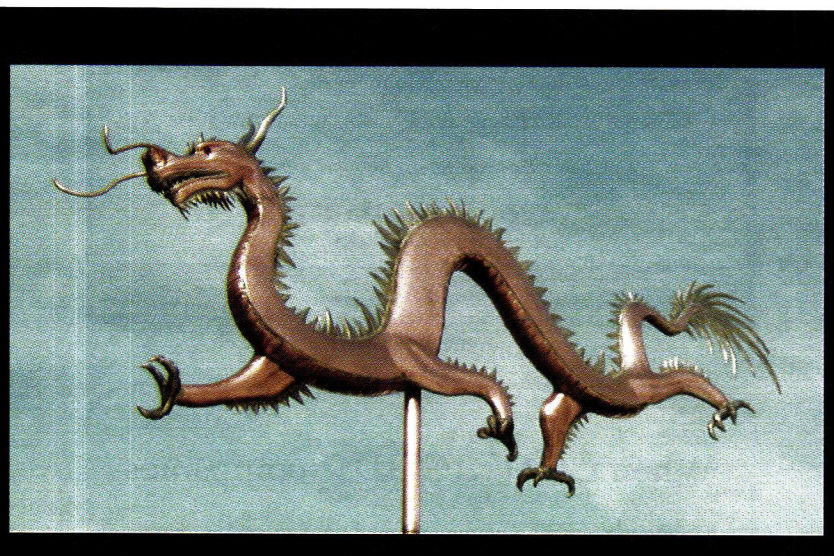

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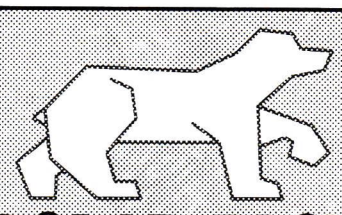

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- Wide array of standard colors. Custom colors also available.

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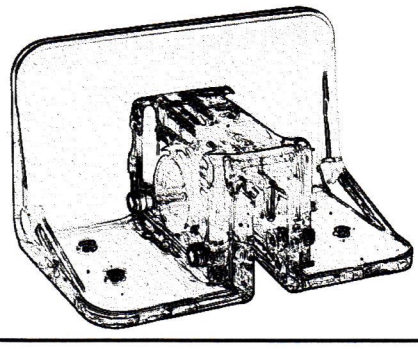

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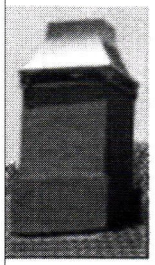

Chimney Caps
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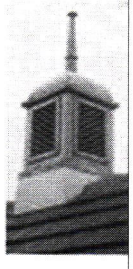

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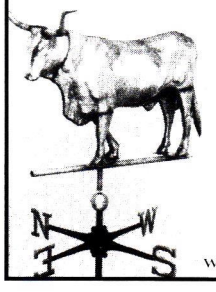

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www.guttersupply.com
Lake Forest, IL 60045

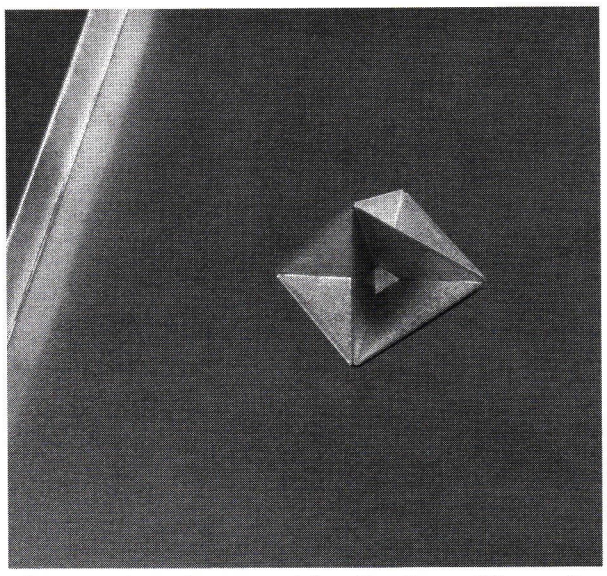
Supplier of gutter materials & equipment: gutters, flashing, conductor heads, downspouts, coils, architectural sheetmetal, hangers, guards, strainers, fasteners & more.
Write in No. 1191

Slate & Copper Sales Co.
814-455-7430; Fax: 267-200-0800
www.slateandcopper.com
Erie, PA 16507

Manufacturer & distributor of a full line of roof & gutter systems: World Gutter System, leader heads, rain chains, dormer vents, finials, cupolas, metal chimney caps, clay chimney tops, snowguards & more.
Write in No. 8062

Sno-Gem, Inc.
888-766-4367; Fax: 815-455-4367
www.snogem.com
McHenry, IL 60050

Manufacturer of Sno-Gem snowguards in clear or color-matched UV-stabilized polycarbonate or metal: copper, stainless steel, galvalume & prefinished Kynar 500 for metal, slate & shingle roofs.
Write in No. 334



The original metal snowguard from Sno-Gem is 2 1/2 in. tall, 3 1/2 in. deep and 3 1/2 in. wide and can be used with slate, asphalt or metal roofing.

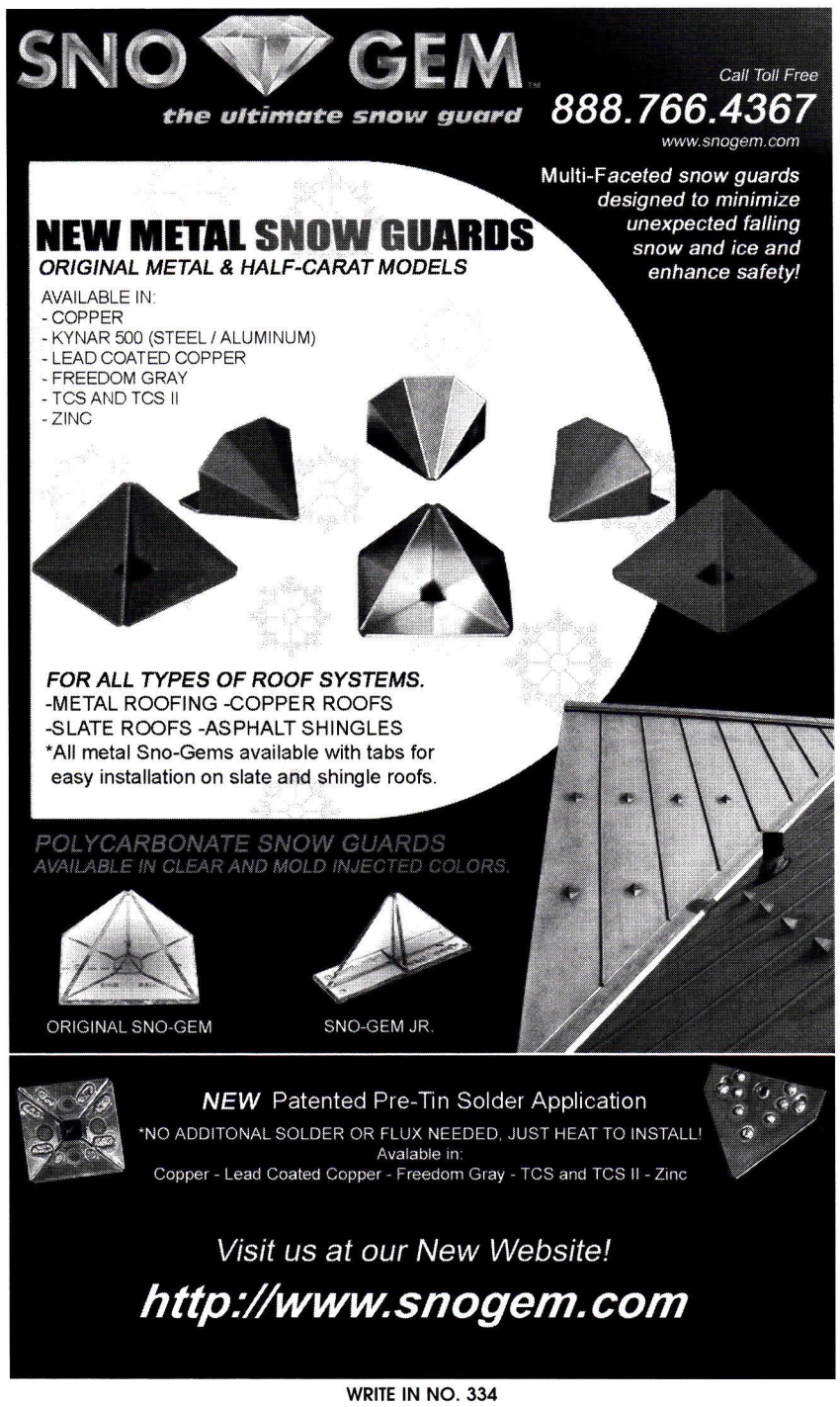
Weather Guard Building Products
800-999-6240; Fax: 303-307-0909
www.wgbp.com
Denver, CO 80239

Manufacturer of metal gutter & roofing systems: residential, commercial & industrial; aluminum, galvanized steel, Zincalume, Rheinzink & copper; snowguards, finials, weathervanes, roof flashing, custom fabrications & accessories; colors coordinate with siding & trim; gutter chains, leaders & roofing tools.
Write in No. 8065

The 36-in.-tall Fiddler weathervane from Weathervane Sculpture was hammered freehand in copper and given leaded-copper highlights.

Weathervane Sculpture
413-568-0548; Fax: 413-564-6028
www.weathervanesculpture.com
Westfield, MA 01085

Metalworking studio: sculpture & weathervanes since 1989; freehand hammered from copper, brass, leaded copper & stainless steel; each piece is one of a kind; standard or custom; full- & swell-bodied & silhouette weathervanes; finials.
Write in No. 1198



WRITE IN NO. 334

WRITE IN NO. 758

When contacting companies you've seen in the issue, please tell them you saw their listing in Period Homes.

Wood Roofing

Bartile Roofs, Inc.
800-933-5038; Fax: 801-295-3485
www.bartile.com
Centerville, UT 84014

Custom fabricator of color-blended lightweight concrete roof tile: interlocking turret tile; slate-replica tile; wood shingle-replica tile; more than 300 colors & 9 profiles.
Write in No. 1182

Bartile's Western Shake is purposely scaled smaller than other tile products and blended during production to simulate the appearance of wood shakes.

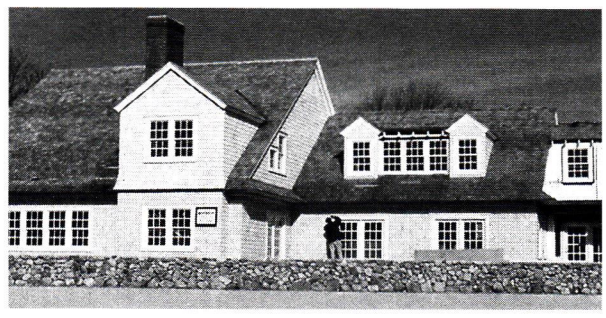
Period Homes
maintains the central web site for historically inspired residential products and services on the internet – products used for restoration, renovation and new construction. There's more information and links to historical products than you'll find on any other site.

Log onto and then bookmark:
www.period-homes.com

www.period-homes.com

Liberty Cedar
401-789-6626; Fax: 401-789-0320
www.libertycedar.com
West Kingston, RI 02892

Supplier of decay-resistant wood roofing & siding: tapersawn, hand-split & resawn shakes; many patterns; custom runs; western red cedar, Alaska yellow cedar, redwood, Douglas fir & mahogany; historical projects.
Write in No. 6530



Wood roofing shakes and shingles from Liberty Cedar are available pressure-impregnated with fire retardants.

New England Thatch Co.
951-360-6062; Fax: 951-360-6961
6961 Adele Ln.
Riverside, CA 92509

Supplier of traditional English & European-style tile roofing with the look of thatch.
Write in No. 1307

This cement and fiberglass tile is made to look like thatch by New England Thatch.

The Wood Factory
936-825-7233; Fax: 936-825-1791
111 Railroad St.
Navasota, TX 77868

Manufacturer of historically correct Victorian millwork: interior & exterior doors & stair parts; screen doors, gingerbread, brackets & corbels, gazebos & porch posts, spandrels, running trim, gable ornament & crestings, fancy-cut shingles, newel posts, rails, balustrades & balusters; reproduction casings, corner & plinth blocks & moldings; custom mantels; column bases & caps, island & table legs, post finials & other turnings; western red cedar, redwood & more.
Write in No. 7120

Vintage Woodworks
903-356-2158; Fax: 903-356-3023
www.vintagewoodworks.com
Quinlan, TX 75474

Supplier of Victorian millwork: western red cedar shingles, porch parts, turned posts, turned & sawn balusters, railings, brackets, gazebos, corbels, custom-length spandrels, mantels, wood storm & screen doors, columns & more; 192-page master reference catalog; 208-page porch-design book.
Write in No. 1061

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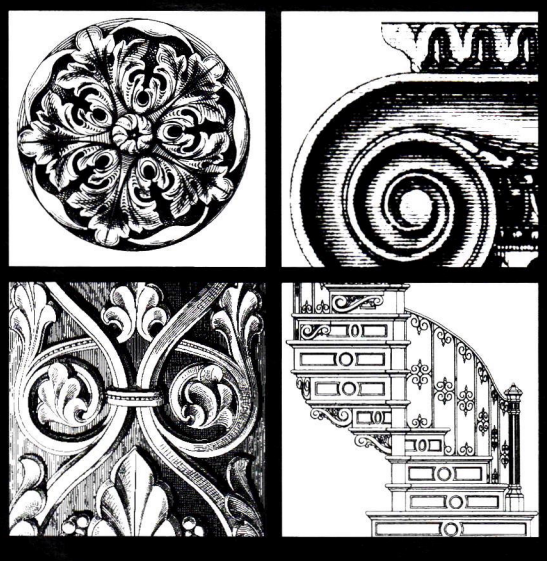

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Style #SB-19 black slate is available from Roof Tile & Slate.

Roof Tile & Slate Co.
800-446-0220; Fax: 972-242-1923
www.claytile.com
Carrollton, TX 75006

Reseller of salvaged roof tile: slate & custom blending of clay tile & used roofing slate; Pennsylvania bluestone interior flooring; specialty trim for historic projects; paving.
Write in No. 9560

Sheldon Slate Products Co. Inc.
518-642-1280; Fax: 518-642-9085
www.sheldonslate.com
Middle Granville, NY 12849

Manufacturer of slate products: benches, tiered & wall fountains, signage & plaques, roofing, floor tile, flagging, structural applications, monuments & kitchen counters & sinks; custom cutting; natural stone planters & urns; color-matched, custom-fabricated facing stone, block & cladding; quarrier & manufacturer of Vermont slate roofing.
Write in No. 1195

Slate & Copper Sales Co.
814-455-7430; Fax: 267-200-0800
www.slateandcopper.com
Erie, PA 16507

Manufacturer & distributor of a full line of roof & gutter systems: World Gutter System, leader heads, rain chains, dormer vents, finials, cupolas, metal chimney caps, clay chimney tops, snowguards & more.
Write in No. 8062

Slate International, Inc.
301-952-0120; Fax: 301-952-0295
www.slateinternational.com
Wilmington, DE 19808

Distributor & importer of roofing slate: domestic & imported; all colors; new natural slate; slate color matching for repairs & restoration; fasteners & attachment systems; ridge vents for slate roofs.
Write in No. 9340

The slate on this roof from Tile Roofs is multi-sized for historical accuracy.

Tile Roofs, Inc.
888-708-TILE; Fax: 708-479-7865
www.tileroofs.com
Frankfort, IL 60423

Supplier & installer of new & salvaged clay tile & slate roofing: will match existing roofing for historic properties; tile-roof repair contracting; restoration services; clay, terra cotta, concrete & fiber-cement.
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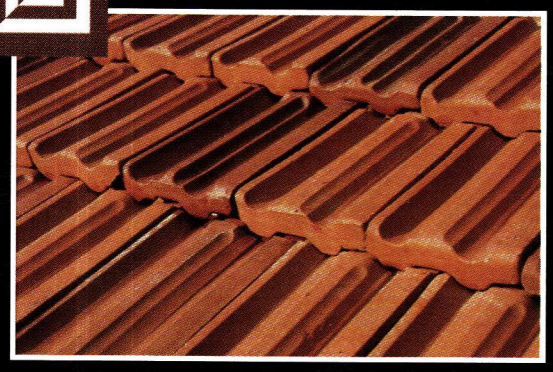

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WRITE IN NO. 111

New Tile for an "Old" Roof

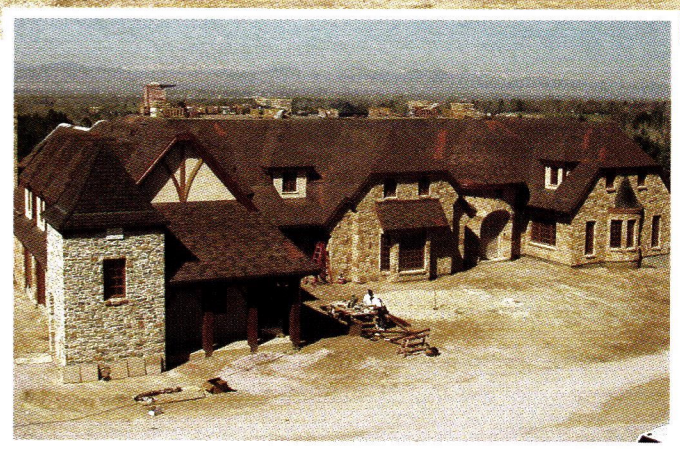
Tile roofing for a new French Country residence was designed to give the building a historic look. *By Hadiya Strasberg*

There are innumerable decisions that go into the design of a home – the choice of style, size, massing and materials, to name a few. In a successful design, all of the elements come together to form a cohesive whole, but some features, such as the roofing, have the power to either make or break a house.

In the case of a private residence in the Cherry Hills Village neighborhood just south of Denver, CO, a clay-tile roof, along with the tower, turrets, rounded hips, rolled edges and valleys, identify the style of the home as French Country. The roof tile's distressed appearance blends seamlessly with the limestone, the textured stucco walls and the wood timbers.

The house, however, was not built centuries ago, but is a new construction that will be completed in January 2005. It is the roofing design, with its unique color, texture and detailing, that achieves the appearance of patina, says Stuart Matthews, owner of Northern RoofTile Sales Co., Inc. (NRT), of Dundas, ON, Canada.

The idea, says Matthews, was that "the tower and garage were meant to [give the appearance of] the original buildings of an old farmhouse, while the house [appeared to be] added on years later." Architect Don Ruggles of D.H. Ruggles & Associates in Denver adds: "The story that was created for the home adds a sense of intimacy and warmth, qualities the owners requested."



Northern Roof Tile Sales Co., Inc., of Dundas, ON, Canada, manufactured the clay roofing tile for this private residence outside of Denver, CO. A custom blend of standard Tunstall tile was chosen to impart a distressed appearance.

Insert: Denver-based architect D.H. Ruggles & Associates designed curved and rolled exterior elements that accentuate the French country style of the house. The tile that covers these towers, turrets, rolled hips, edges and valleys was installed with ripples, sags, ridge lines that weren't perfectly straight and other subtle details to make the house appear older than it is.

Tile Selection

At 16,000 sq.ft., the house is sizable, but "the tile's earth-tone rusty colors and rough, fabric-like texture create less of a formal manor house and more of a cottage feel," says Ruggles. The type of tile was narrowed down from a series of mockup panels. After Tunstall tile was chosen, Harrison Custom Builders of Englewood, CO, produced a second series of mockups on-site. "These were actually complete walls with the stone, a window and a roof with the correct pitch," Matthews says. "It was important that the homeowner saw the tile in the natural environment – in the sunlight, in the shade, on a cloudy day, etc." Ruggles adds, "For a project of this size and caliber we always have a mockup." The architect and owner chose a combination of light-brown Etrurian, dark-brown Etrurian and rustic-red Mercian Echoes Tunstall tile.

The more than 53,000 clay tile from NRT were hand crafted in the Daniel Platt factory in the village of Tunstall in Stoke on Trent, England. Tile makers extruded the clay, rubbed the color onto the surface and then whacked it to form a relief on the surface. It was then left to dry for up to seven days, after which it was fired. "This custom process assures us that no two tile are alike," says Matthews. Source Products Group, Inc., of Broomfield, CO, a supplier of roofing tile that recently partnered with NRT to be the first dealer in North America to represent their full line of European tile, distributed the tile.

The tile was custom designed to fit the home's elaborate elements. "Tile for the rolled ridge and rounded hips was custom made to fit the roof," says Matthews. The tower, turrets and other curved features complicated the installation of the tile and required expert work, but added much character and visual interest. "Due to the curved roof areas, all of the tile had to be custom cut on-site," says Kevin Grimes, president and operations manager with roofing contractor Platte Valley Roof Systems of Denver. "Every tile was cut into a wedge shape with the tile at the bottom of the turrets cut with a lesser degree of taper than the row above it and so on until you reach the apex of the turret radius." The tile was cut with a wet saw and then diamond drilled. Both Matthews and Ruggles applaud the roofing contractor. "The craftsmanship and patience possessed by Platte Valley was amazing," says Ruggles.

Platte Valley fastened the tile to the roof membrane with 2½-in.-long copper nails. The crew worked from a 44-ft. lift that can pivot and elevate them to a position that allows them be right on top of their work and to inspect their work from a curb side angle to make sure it's just right.

Ruggles designed rolled edges on the roof that complement the curved bays and turrets. The tile was custom manufactured and custom cut on-site to fit.

The tile was installed on this curved bay before the roofing contractor, Denver-based Platte Valley Roofing Systems, tackled the 47-degree slope of the main roof.

Installation Challenges

The roof installation took just over one year, from March 2003 to April 2004; most roofs are installed between six and 10 weeks. Grimes says, however, that "this is not atypical for a project this large. The turrets and curved areas on this residence actually took more time to complete than all the other details of the roof system combined. The sheer size of the roof, combined with the detailed work and the on-site blending of the colors were also challenges."

Another challenge arose prior to the tile installation. The homeowner had requested that the floors be raised by 18 in. to increase the height of his view, but it made the top of the roof too high according to the local building code. "You can't just reduce the pitch of the roof," Matthews explains, "because that would adversely affect the interior." After conferring with Ruggles, the top of the ridge line was rolled so that the last five courses of tile were made with a curvature in the length to match the roll of the ridge line.

Once the framing was complete and the roof membrane installed, the Tunstall tile, which has no nibs, was installed directly to the deck. It was then fastened to the roof membrane with 2½-in.-long copper nails.

At the request of the homeowner, the color palette included dark-brown tile with red tile in a few patches. "The dark brown was to show an old, mossy and water-beaten look, like the tile has taken an excessive amount of water throughout the years and should be leaking and in need of replacement," says Grimes. The Mercian Echo tile was installed in some areas to make parts of the house appear old. The idea is that it looks as though repairs were made to the tile roof throughout the years. The tower and garage roofs were covered with tile that "looks as though it's been there for centuries," says Grimes. "I've actually been asked by people touring the site if it was safe to stand under the eave. They thought the roof tile was really ready to fall off and hit them."

The tile won't fall off; it has a 50- to 100-year life span. Its old-world look was achieved with design, manufacturing and installation tactics and a team effort among the homeowner, architect, supplier and factory. The tile "makes" the house, composing an aged look for the entire structure. ■

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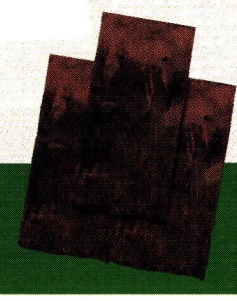

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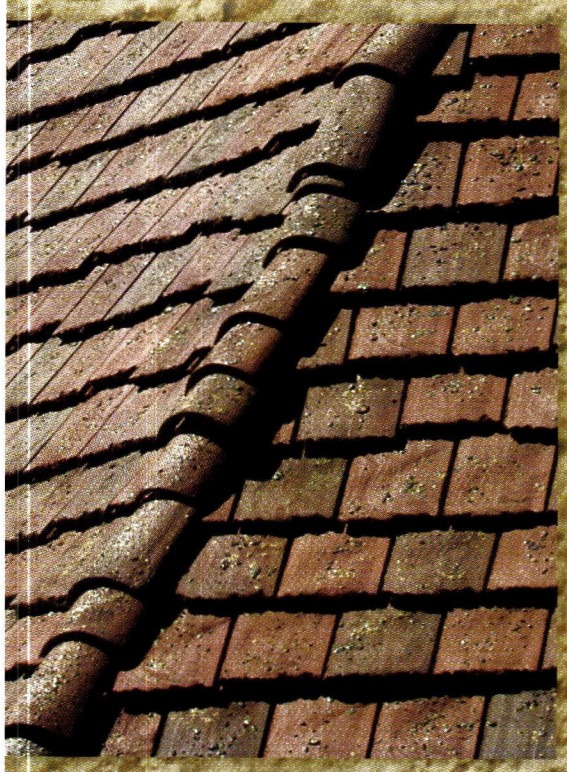

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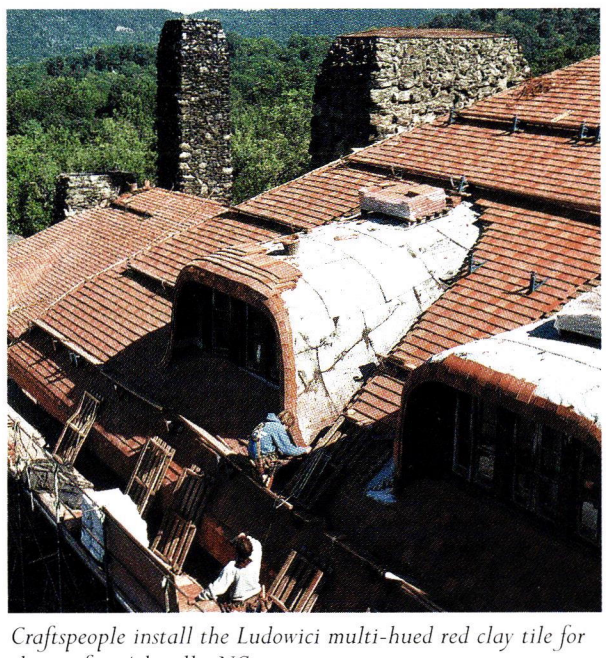

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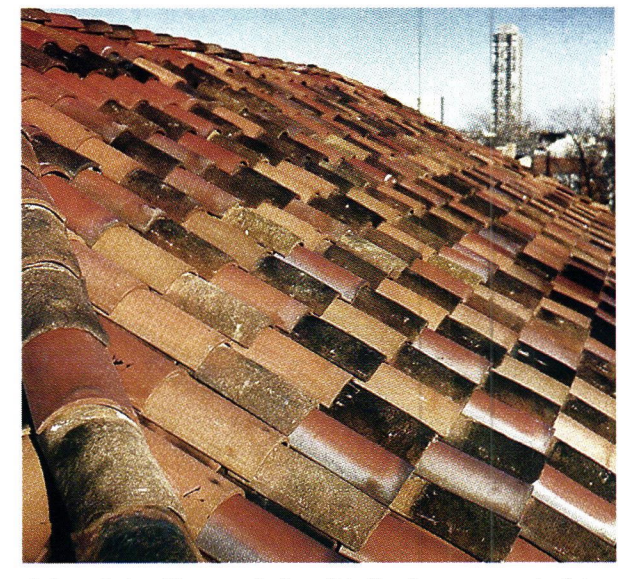

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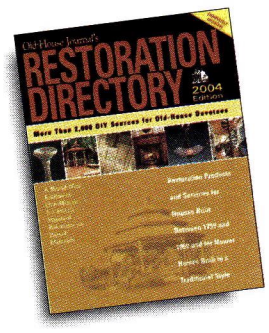

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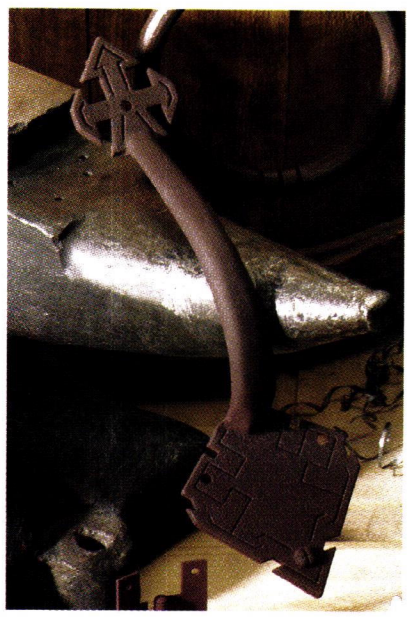

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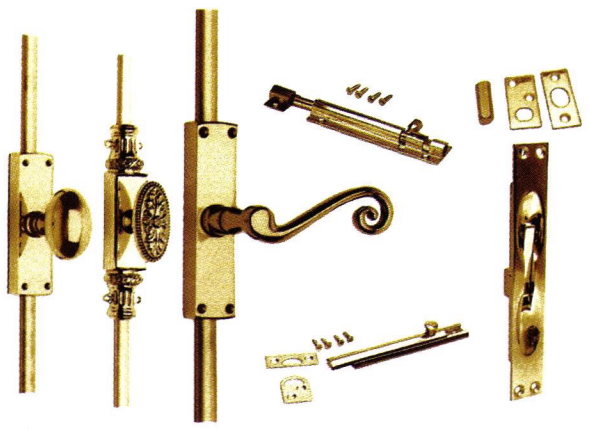

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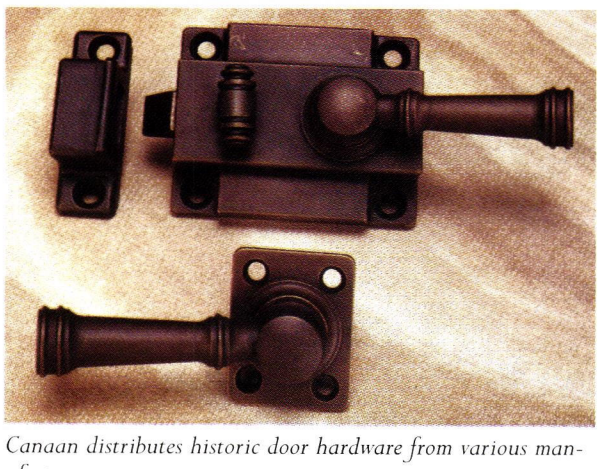

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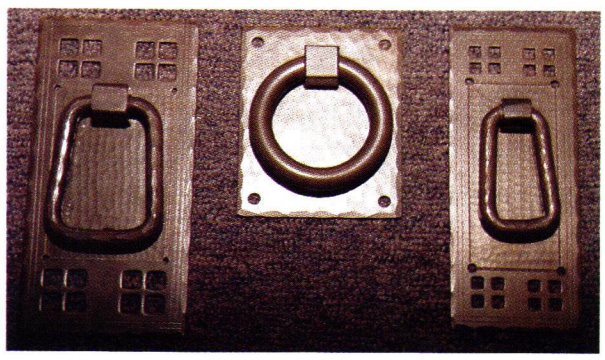

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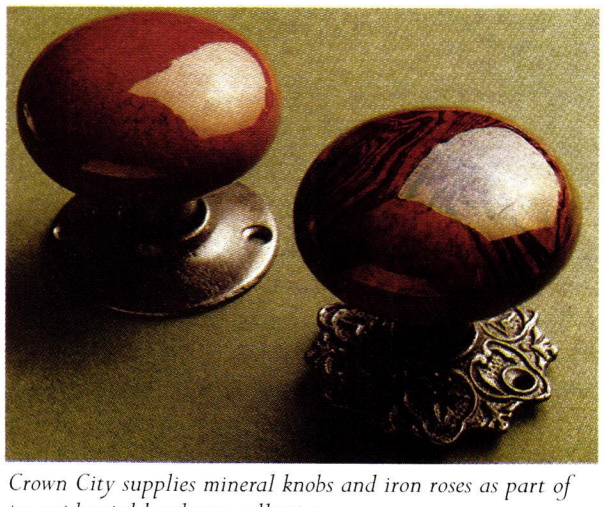

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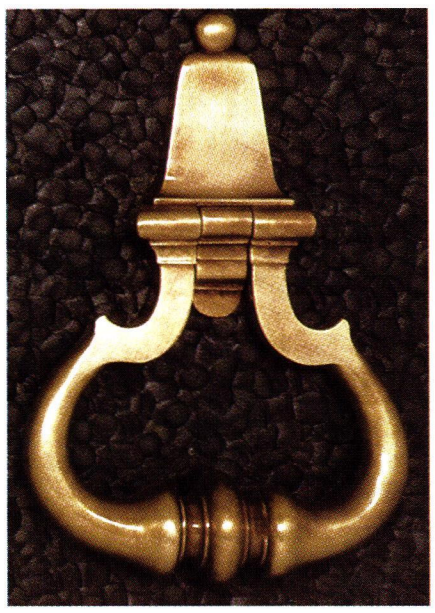

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Manufacturer of handmade period hardware: bathroom fixtures & accessories; furniture, door, bath & builders hardware; Louis XIV, Art Deco & other styles; tables & objets d'art; since 1857; brochure $25.
Write in No. 343

These knobs and pulls are from H.T. Sales' Midtown West series.

H.T. Sales Company, Inc.
212-265-0747; Fax: 212-262-0150
www.htsalescompany.com
New York, NY 10019

Distributor of architectural & decorative hardware: for windows & doors; brass knobs, levers, plates, hooks, locks & more; custom casting & fabrication; professional hardware consultants & locksmiths.
Write in No. 1165

House of Antique Hardware
888-223-2545; Fax: 503-233-1312
www.houseofantiquehardware.com
Portland, OR 97232

Supplier of door, window, cabinet, electrical & bath hardware: stair rods & dust corners; brass tube, solid brass & plated steel; original antique & vintage reproductions; Victorian & Arts & Crafts.
Write in No. 339

James Peters & Son, Inc.
215-739-9500; Fax: 215-739-9779
1934-40 N. Front St.
Philadelphia, PA 19122

Manufacturer of period-style hardware: for exterior shutters, doors, windows, gates & barns; stable hinges, shutter dogs, pull rings, door latches, slide bolts & more; new reproduction hardware; wrought steel with black finish & wrought iron.
Write in No. 1240

The Beetle Thumbturn from Kayne & Son was custom fabricated in wrought iron.

Kayne & Son Custom Hardware, Inc.
828-667-8868; Fax: 828-665-8303
www.customforgedhardware.com
Candler, NC 28715

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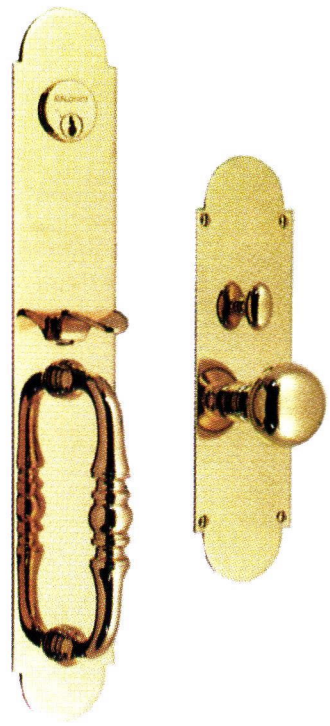

The Lancaster handle set, #6543 from Kolson, can be ordered in latch or knob styles.

Kolson, Inc.
516-487-1224; Fax: 516-487-1231
www.kolson.com
Great Neck, NY 11023

Distributor of kitchen & bath fittings & accessories: tubs, toilets, bidets, sinks, faucets & medicine cabinets; cremone bolts, window, transom, decorative door & cabinet hardware.
Write in No. 3760

Leonard Metal Art Works
800-522-4766; Fax: 888-699-9666
www.grand-stairs.com
Lansdale, PA 19446

Custom fabricator of ornamental metalwork: gates, fences & stair railings; door handles, lock plates, locks & hinges; wrought iron, brass, bronze & stainless steel; old world, Baroque, Gothic, French provincial & Art Deco; old-world door hardware.
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Leonard Metal custom fabricated the decorative foliate door pulls on these doors.

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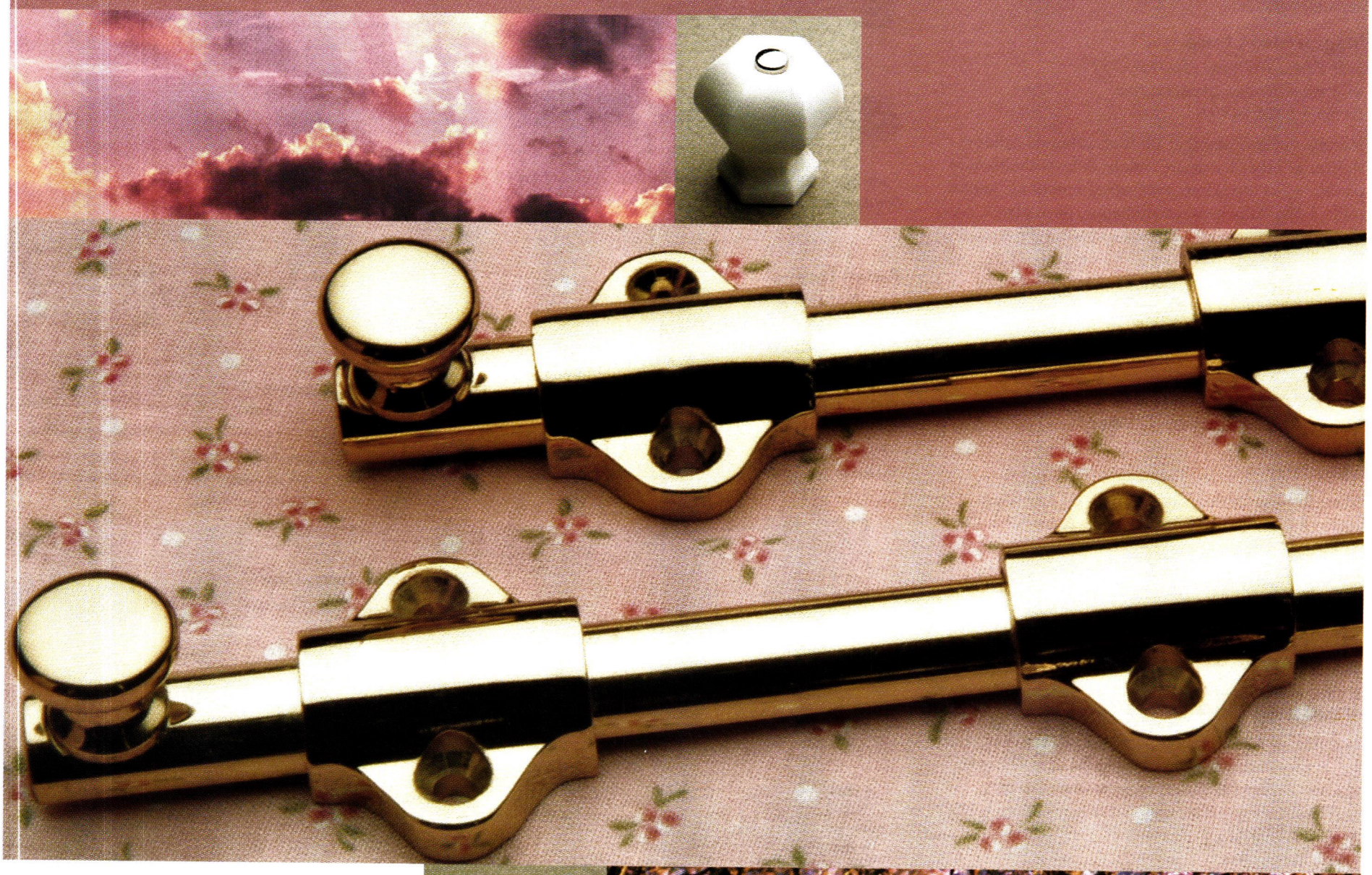

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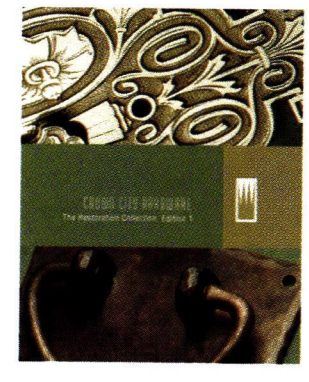

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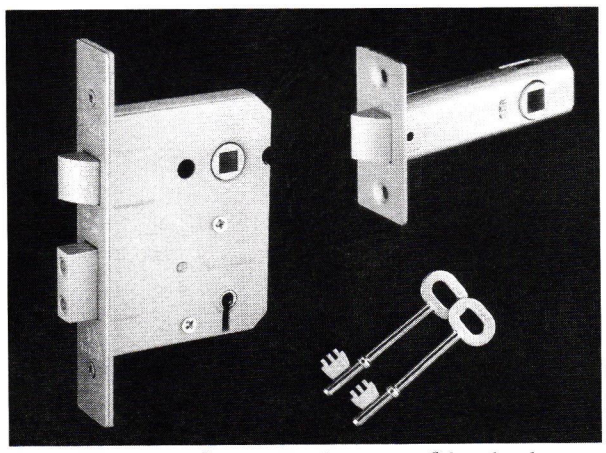

Maguire Iron manufactures a wide variety of door hardware, including bolts.

Maguire Iron Corp.

510-234-7569; Fax: 510-232-7519
www.maguireironcorporation.com
Richmond, CA 94801

Manufacturer & supplier of door, cabinet, window, shutter & other hardware: knobs & levers with compatible locks of various backsets & functions; hinges, pulls, bolts, knockers, escutcheons, push plates, cremone bolts, electric bell buttons, bell pulls & mailbox hardware; porch- & wall-mounted lighting; wrought iron, pewter, rust, brass & bronze; 17th-century, Art Deco & other styles; custom work.
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www.medeco.com
Salem, VA 24153

Manufacturer of door hardware & UL437-listed locks: knobs/escutcheons, locksets & lever handles; solid-brass construction; high-tensile steel bolts & heavy-duty mounting hardware; various finishes.

Mitchell, D.C.

302-998-1181; Fax: 302-994-0178
www.dcmitchell.org
Wilmington, DE 19804

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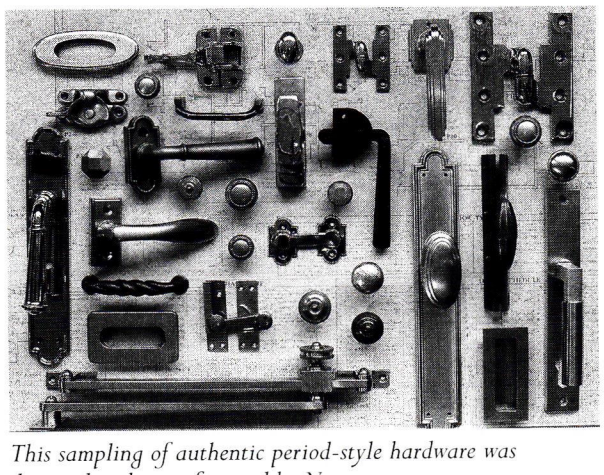

This sampling of authentic period-style hardware was designed and manufactured by Nanz.

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212-367-7000; Fax: 212-367-7375
www.nanz.com
New York, NY 10013

Designer & manufacturer of period-style residential door & window hardware: Gothic to modern; specialized finishes; will work directly with architects, designers & builders; consultation, specification & restoration services.
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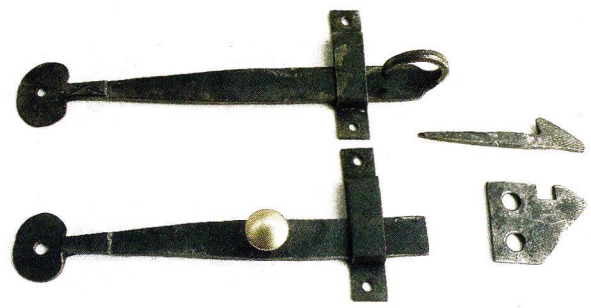

Early American closet door assemblies are available from Old Smithy Shop in three finishes with a loop or a knob.

Patten Design

714-894-0131; Fax: 714-894-0031
15561 Product Ln., #D-5
Huntington Beach, CA 92649

Manufacturer of custom door & window hardware: knobs, levers, locksets, pulls, hinges, cremones & escutcheons; all styles; non-ferrous metals & stainless steel; large & small runs.
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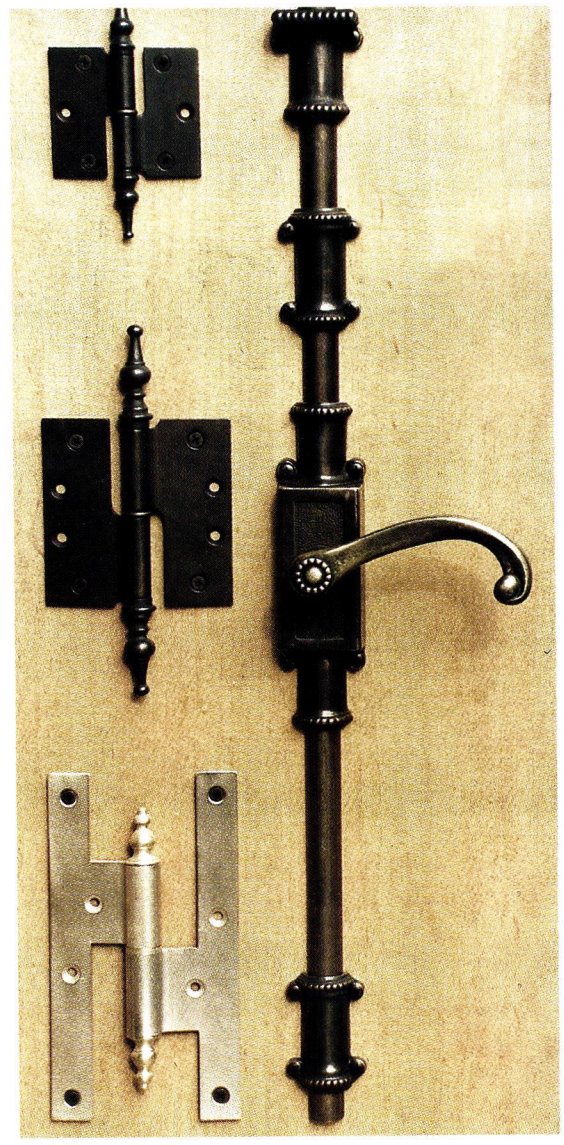

Period-style door hinges and cremone bolts are offered by Patten Design in various finishes.

Phelps Company

802-257-4314; Fax: 802-258-2270
www.phelpscompany.com
Brattleboro, VT 05301

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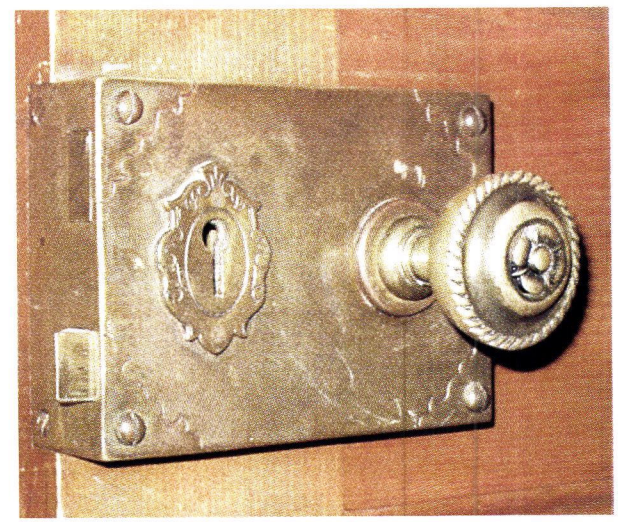

Stevens Hill deconstructed the Pabst Mansion in Wisconsin in order to preserve such architectural salvage as this heavy lockset with flower-decorated doorknob.

Strybuc Industries

800-352-0800; Fax: 610-534-3202
www.strybuc.com
Sharon Hill, PA 19079

Supplier of door & window replacement hardware: for renovation & restoration projects; screen tools, spline, wire & cloth, hardware & accessories; patio door hardware & screens; builders hardware, wicket screens & more; sells exclusively through distributors; catalog of more than 4,000 drawings.
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www.titaniumcustomhardware.com
Westport, CT 06880

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www.vandykes.com
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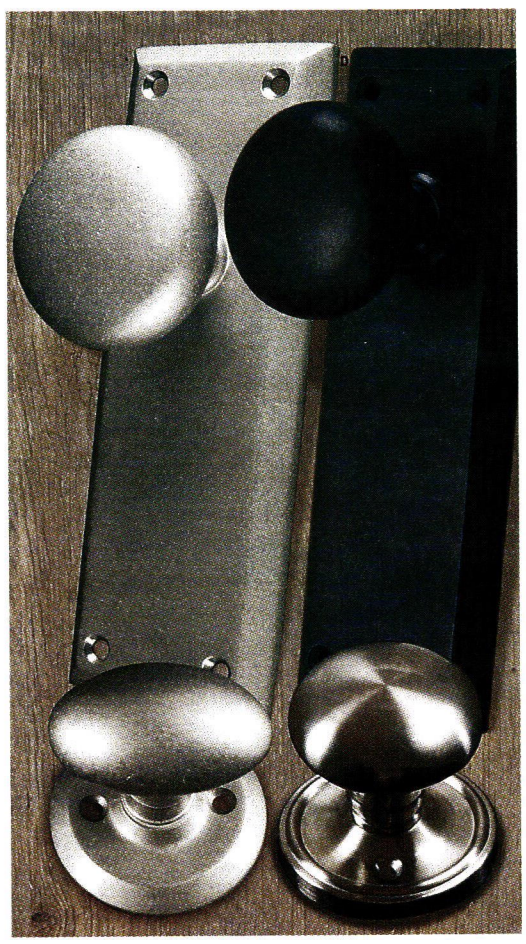

The Restorer's Cabin Series by Van Dyke's is manufactured in solid brass.

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www.wmjrigby.com
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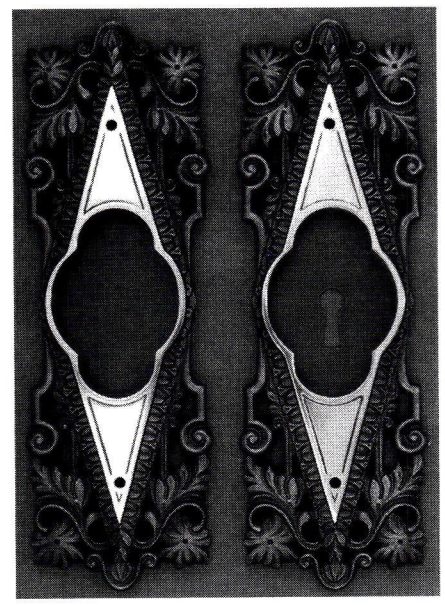

This decorative sliding-door hardware set was supplied by Wm. J. Rigby.

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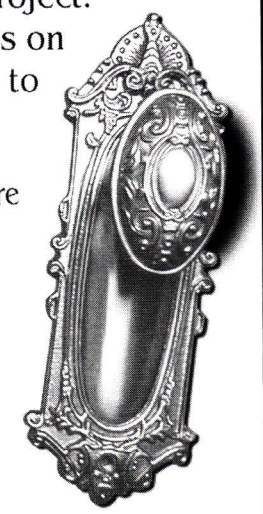

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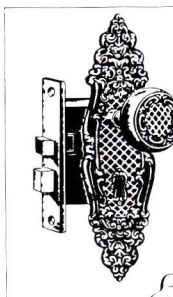

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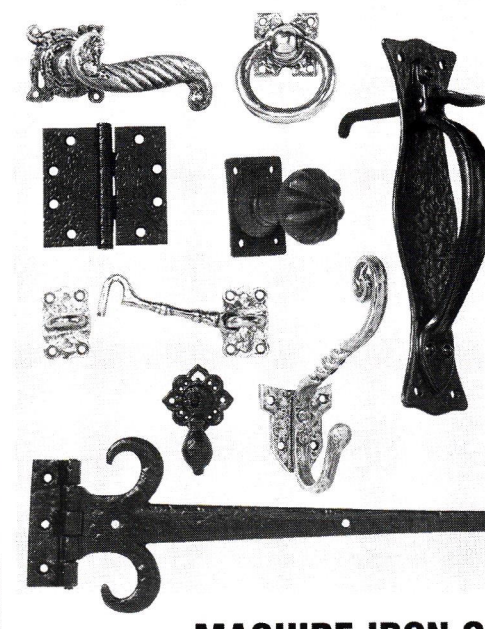

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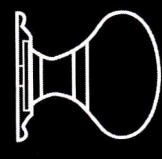

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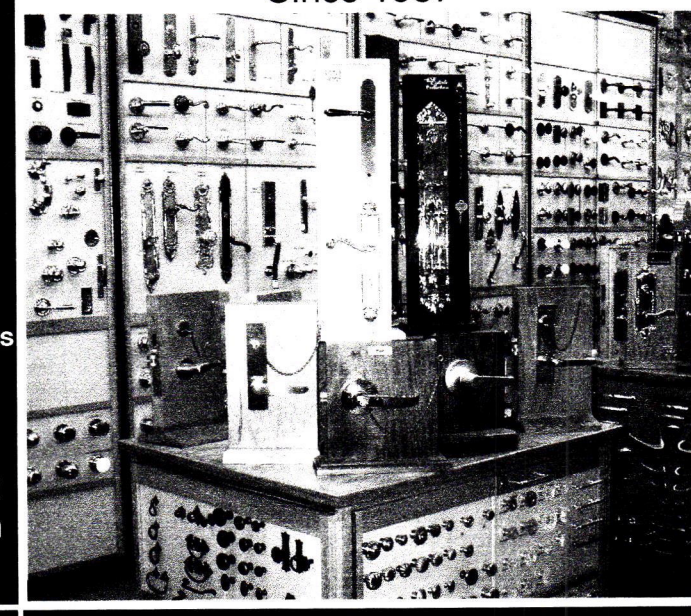

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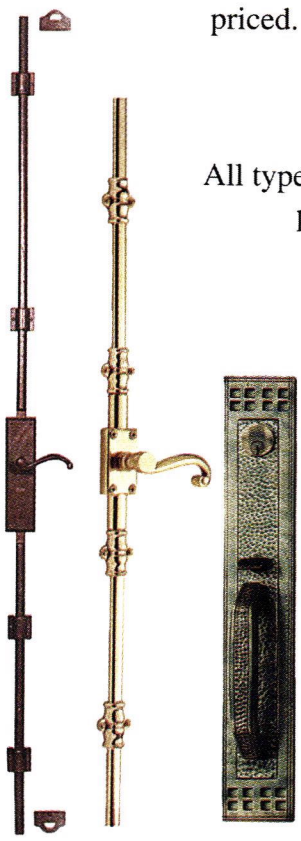

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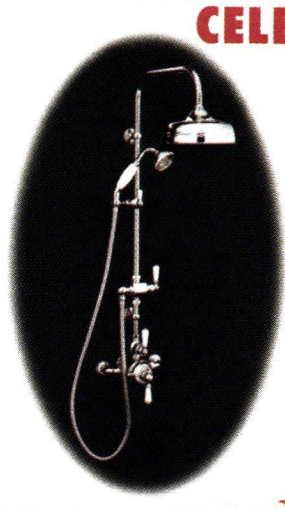

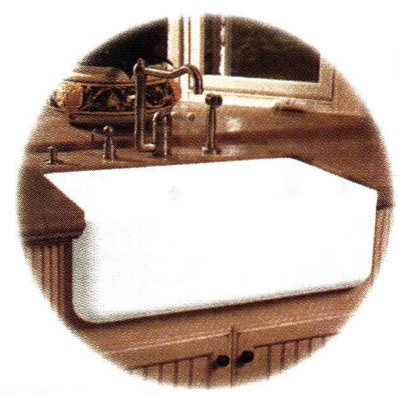

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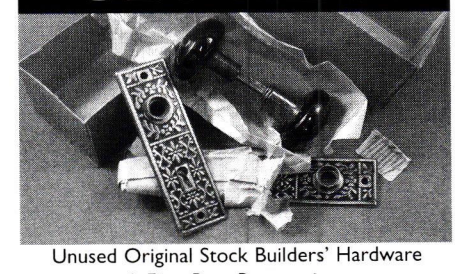

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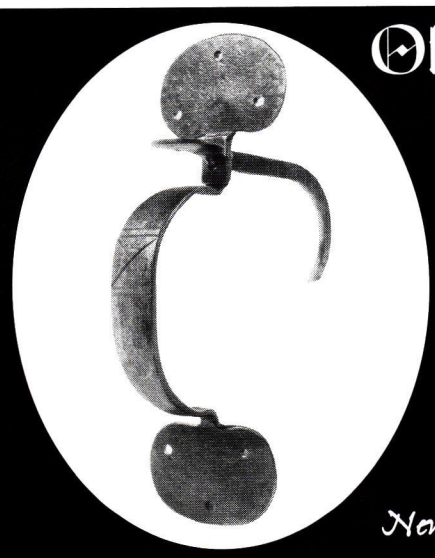

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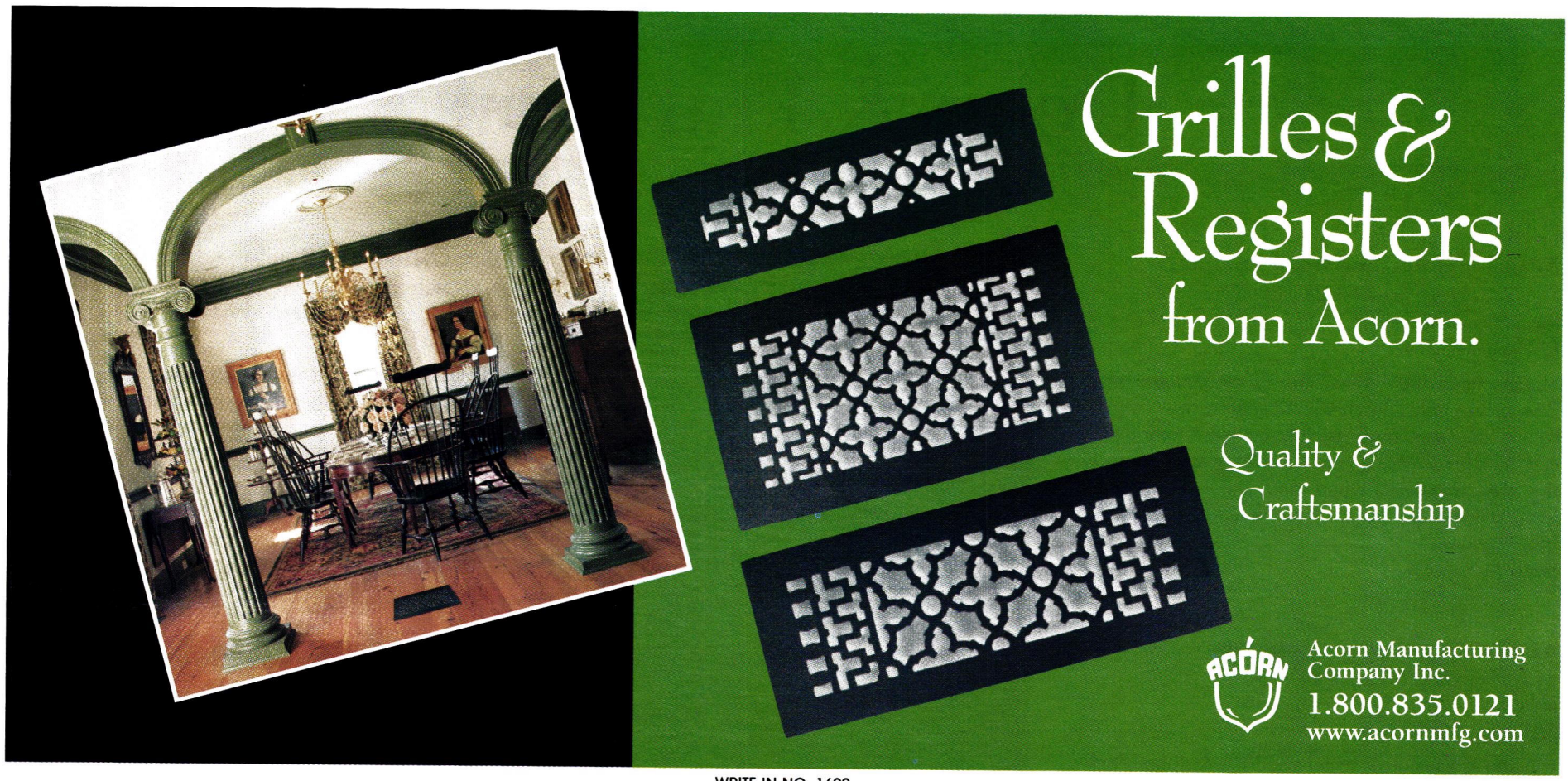

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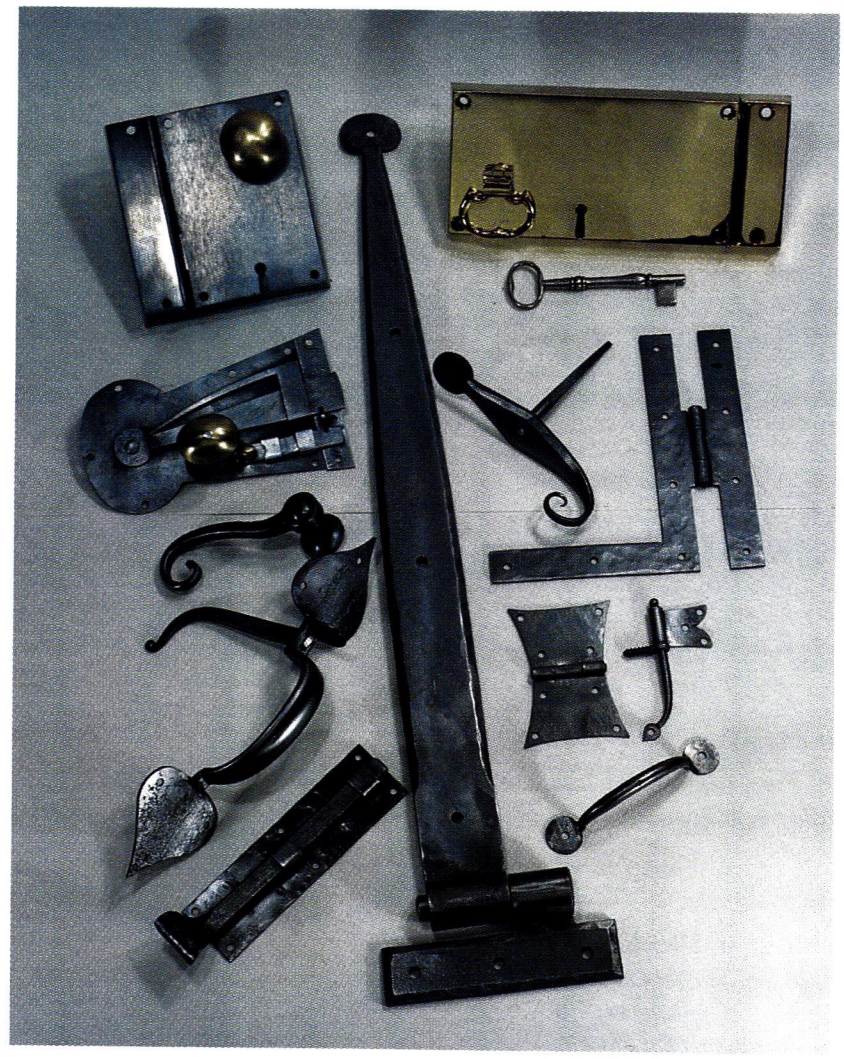

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Architectural Components, Inc.

413-367-9441; Fax: 413-367-9461
www.architecturalcomponentsinc.com
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Custom fabricator of wood windows & doors: traditional details, materials & joinery; paneled, carved, louvered, French, pocket & art-glass doors; casings & moldings, complete entryways & art-glass sidelites & doors; mahogany, pine & others as specified; reproduction & custom work; window replacement & replication; screen & storm doors.

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Reproduction and custom doors are the specialty of Architectural Components.

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800-747-6840; No fax
www.architecturalwindows.com
Saint Petersburg, FL 33712

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800-ART-DOOR; Fax: 732-726-9494
www.artisticdoorsandwindows.com
Avenel, NJ 07001

Manufacturer of custom architectural hardwood doors & windows: all fenestration styles & types; IBC 2000 impact-approved entry doors & windows with insulated glazing; stile-&-rail interior doors with fire ratings to 90 minutes positive pressure; multiple hardwood species & split timbers; authentic & simulated lites; stained, primed & primed & painted finishes.

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Artistic Doors &Windows custom manufactured these hardwood doors to the client's specifications.

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Supplier of traditional French windows & doors: solid French oak & Moabi; classic cremone & espagnolette hardware; true-divided lites; single or insulated glazing; custom sizes; restoration; French firm.

Write in No. 8031

These custom entryway doors were fabricated by Asselin in French oak.

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www.beechrivermill.com
Center Ossipee, NH 03814

Supplier of louvered doors, exterior Spanish cedar shutters & window hardware: duplication & authentic reproduction in any size & period; consultation, design, site visit & installation services; custom work.

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Manufacturer of custom, traditional & historical windows & doors since 1977: old-growth western red cedar; complete units, sash & storm doors & screens; crisp milling detail; shop drawings included; historic restoration; true-divided lites; sloped sills; multiple profiles; most glass types.

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Bergerson fabricated this arched double door in cedar.

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Greensboro, NC 27420

Custom fabricator of solid, one-piece doors: paneled, carved, louvered, French & pocket; MDF & poplar; any design or size.

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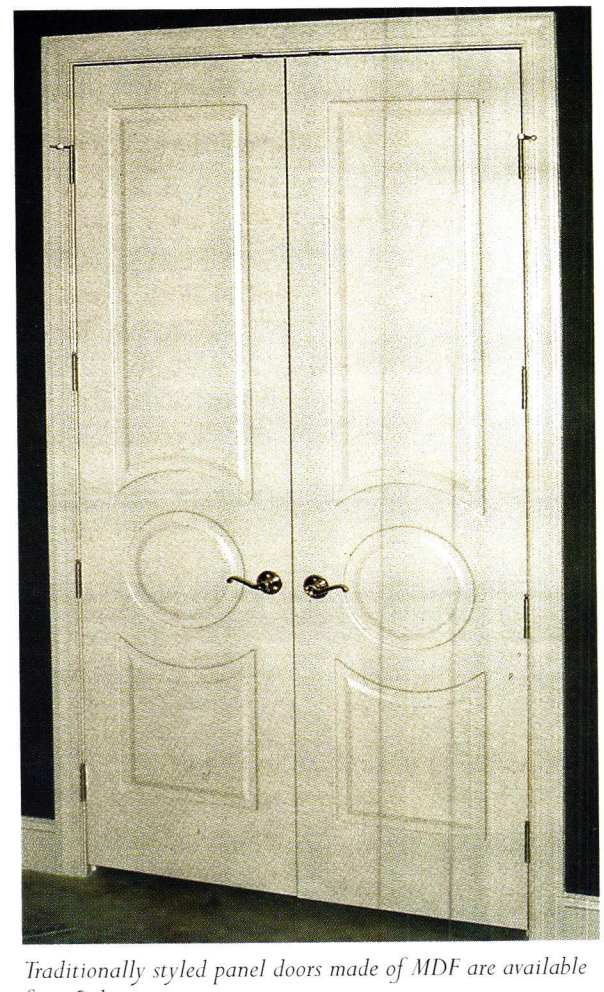

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www.coppawoodworking.com
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Write in No. 9600

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800-367-1884; Fax: 717-243-6502
www.cumberlandwoodcraft.com
Carlisle, PA 17013

Manufacturer & distributor of millwork & ornament: sawn & turned balustrades/railings, corbels, carvings, molding, appliqués, brackets, paneled & screen doors, porch trim, gazebos, arbors, pergolas, mantels, paneling & cabinetry; hand crafted; Spanish cedar, poplar & mahogany; non-load-bearing polymer & carved-wood capitals & columns in oak, maple, mahogany & cherry; licensee of the Victorian Society in America for wood trim.

Custom Trades International, Inc.
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www.sorpetalerusa.com
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www.drumssashanddoor.com
Drums, PA 18222

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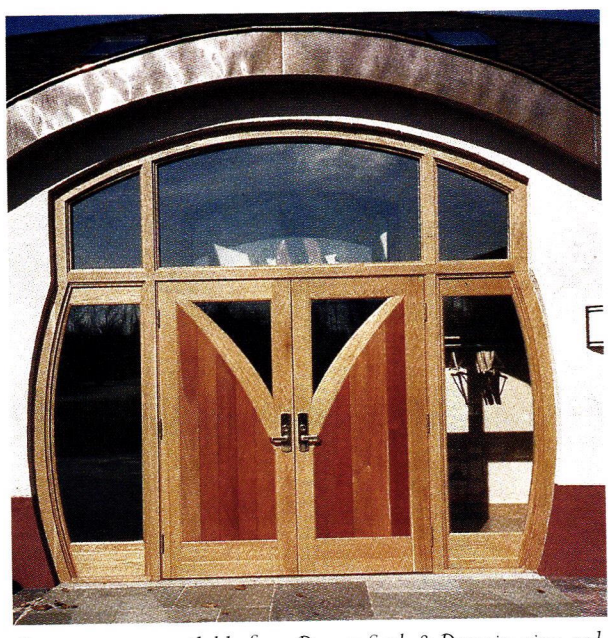

Entryways are available from Drums Sash & Door in pine, red oak, birch and Spanish cedar.

Enjo Architectural Millwork
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Enjo specializes in the manufacture of custom wood doors.

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Write in No. 298

This door, hand-carved by Erik Wyckoff, features grapes and a coat of arms.

Grabill Windows & Doors
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www.grabillwindow.com
Almont, MI 48003

Custom manufacturer of solid-wood & bronze-clad windows & doors: lift & slide doors, casements, tilt-turn, European in-swing & historically accurate double-hung windows with weight-&-pulley operation; hardware finishes, profiles, glass & stained glass.
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This 4x8½ ft. arched-top mahogany door with leaded-glass panel was manufactured by Grabill.

Hahn's Woodworking Company, Inc.
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www.hahnswoodworking.com
Branchburg, NJ 08876

Manufacturer of wood garage & carriage-house doors & traditional swing-out & sliding barn doors: clear mahogany, Spanish cedar & other species; cabinet-grade joinery & true-divided-lite windows; restoration; insulated & custom glass; custom wood entry doors with traditional mortise-&-tenon joinery that match or complement custom garage doors; since 1984.
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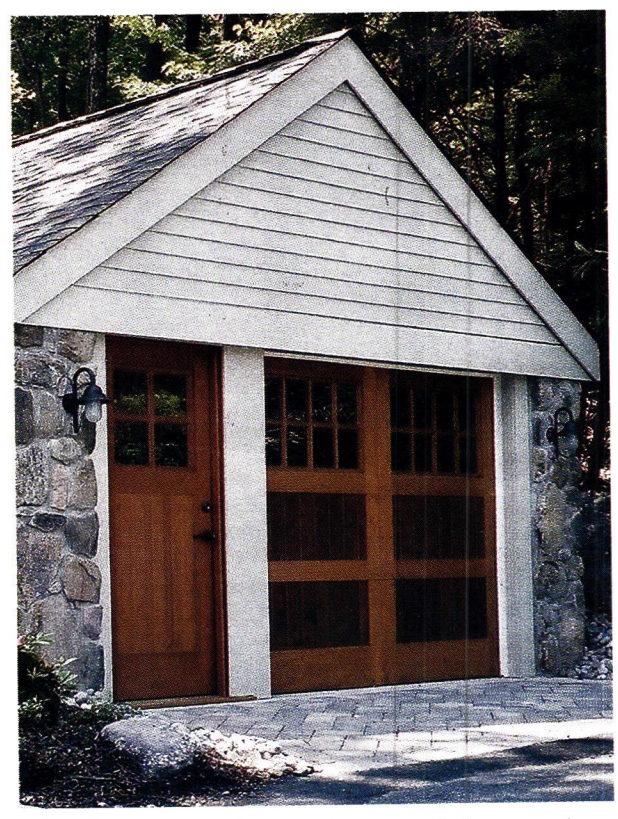

Hahn's manufactured this entry door to match the garage doors.

Heritage Veneered Products
715-526-2146; Fax: 715-526-3226
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Manufacturer of paneled & French wood doors: oak, cherry, maple, birch, poplar & MDF.
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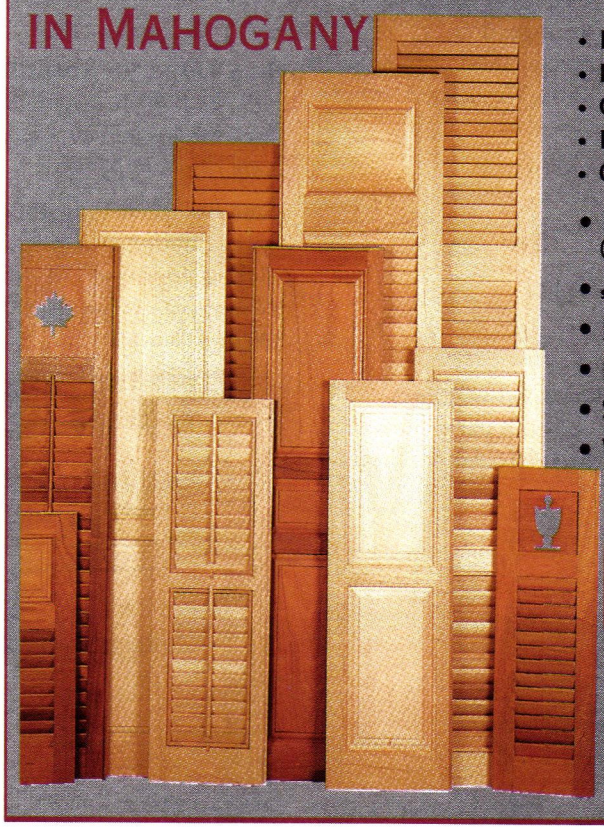

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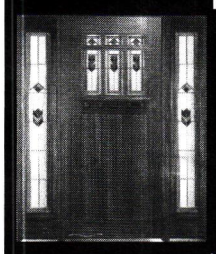

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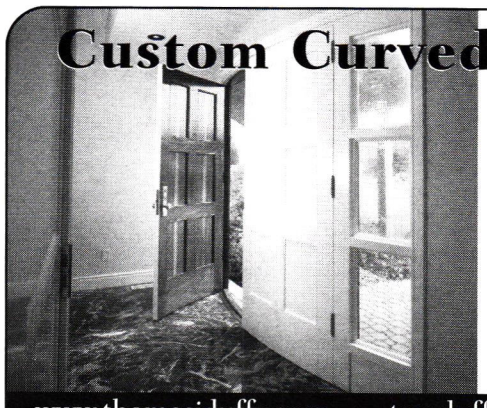

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Custom manufacturer of wood windows & doors: circular casings & moldings; restoration & period-style construction.
Write in No. 3570

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Write in No. 1210

Johnson Millwork, Inc.
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www.johnsonmillwork.com
East Hampton, CT 06424

Manufacturer of custom period wood windows, doors & entryways since 1950: porch parts; turned posts to 12 ft., railings, balusters, circular & elliptical work; replications.
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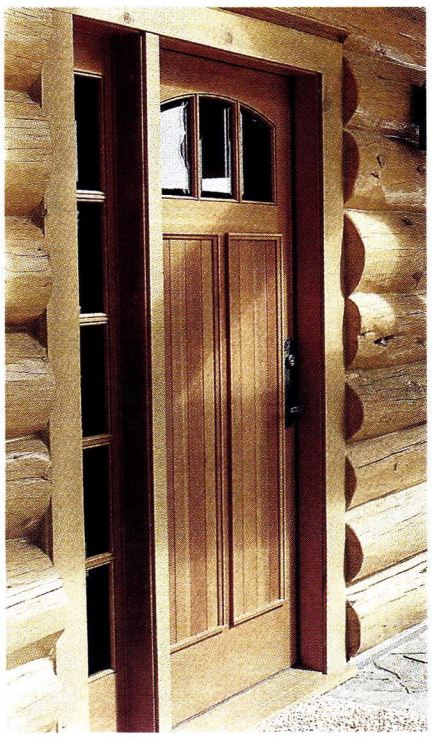

This front door and sidelite were custom built by Joseph Millworks.

Joseph Millworks
541-894-2347; Fax: Same as phone
www.josephmillworks.com
Baker City, OR 97814

Manufacturer of custom doors, windows & millwork: new & restoration; Craftsman styles; true-divided lites; mortise-&-tenon construction; recycled Douglas fir.
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Manufacturer of custom-designed entryways: doors, jambs & thresholds in Honduras mahogany; single & insulated glass, true-divided lites, leaded-glass sidelites & transoms; screen & storm doors & removable panel-screen porch enclosures with an option for glass.
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Custom designed entryways, such as this model with sidelites and a true-divided-lite transom, are the specialty of Kingsland.

La Compania Antigua
505-471-2971; Fax: 505-471-3648
www.lacompaniaantigua.com
Santa Fe, NM 87505

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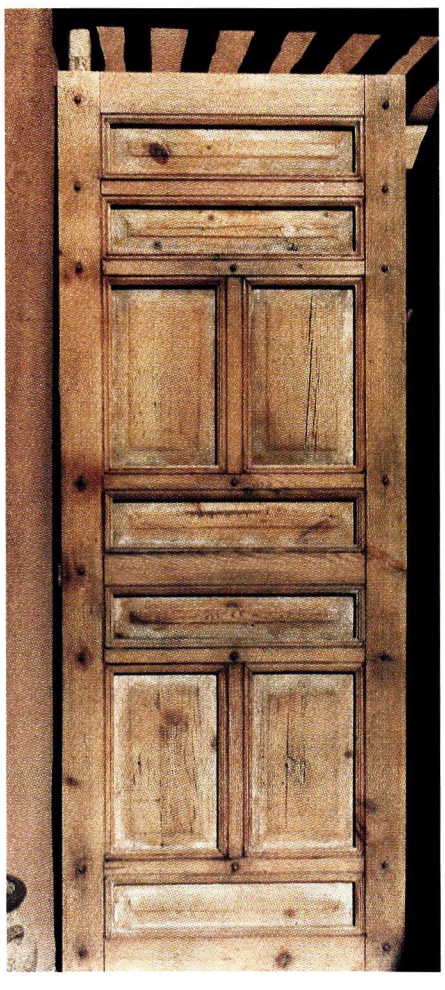

La Compania Antigua created this old-world-style oversized custom door.

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South Acworth, NH 03067

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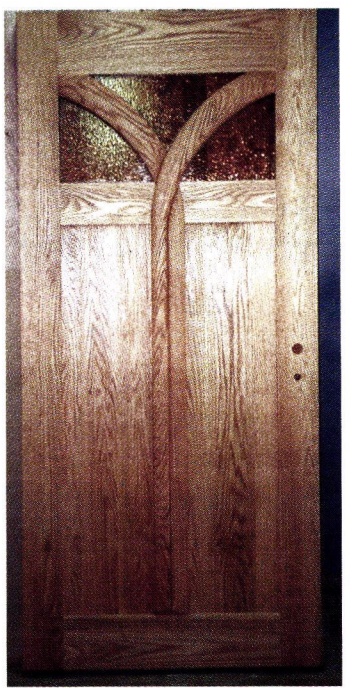

Fabricated by Lamson-Taylor, this insulated, exterior oak door with true-divided lites combines both Arts and Crafts features and an Art Nouveau motif.

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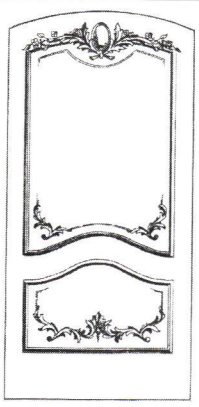

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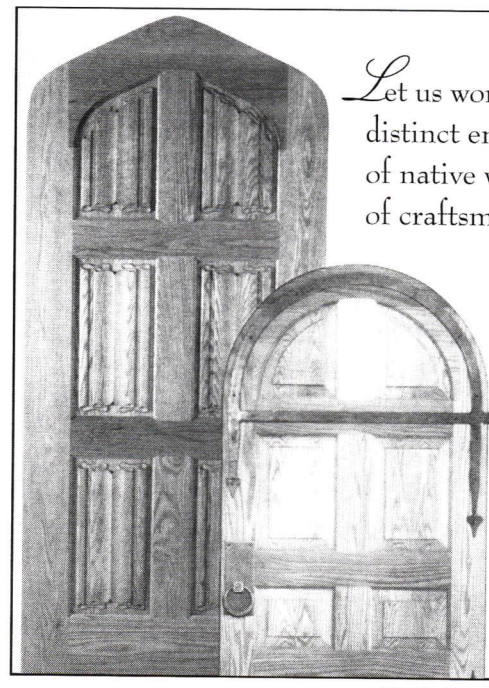

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www.simpsondoor.com
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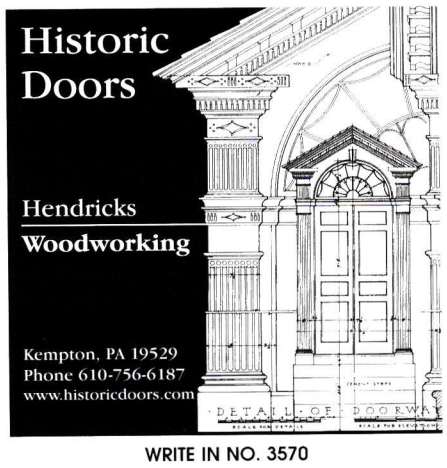

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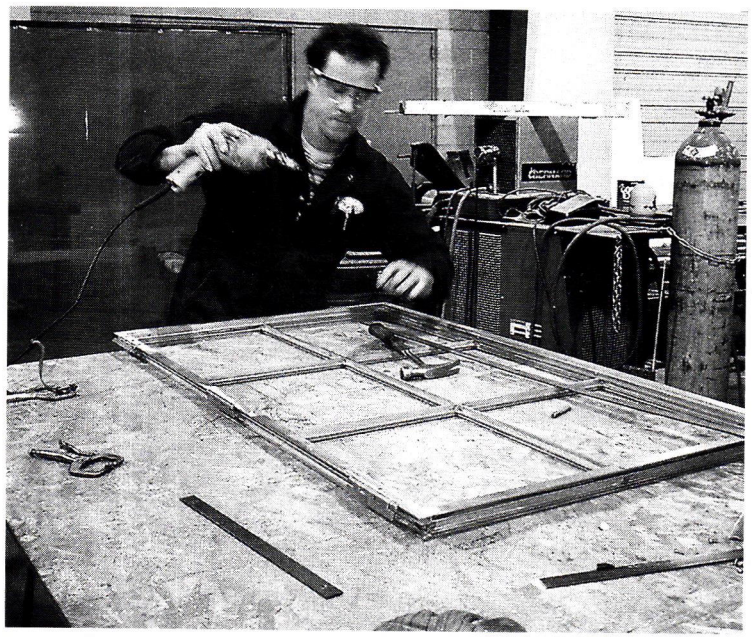

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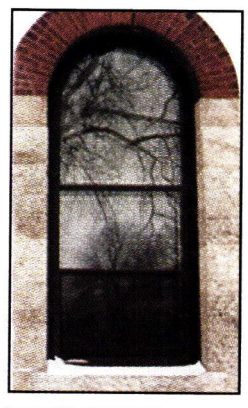
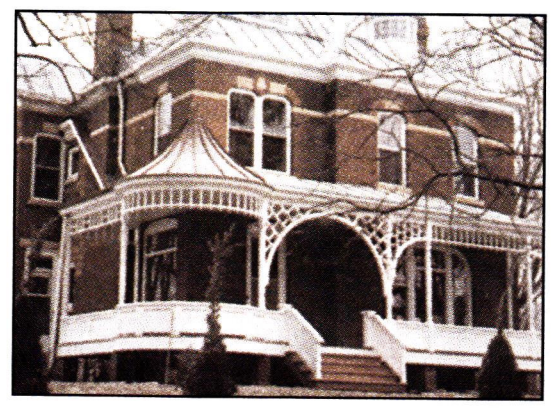
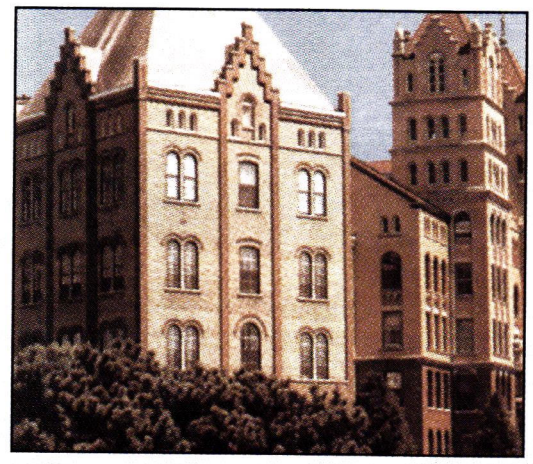
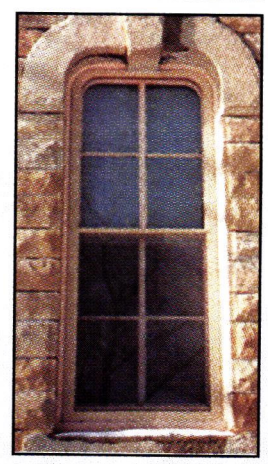
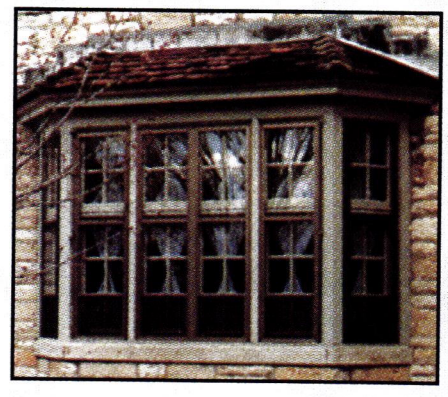
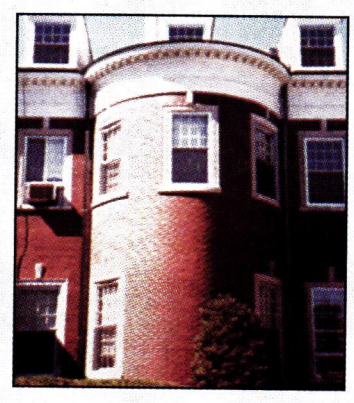

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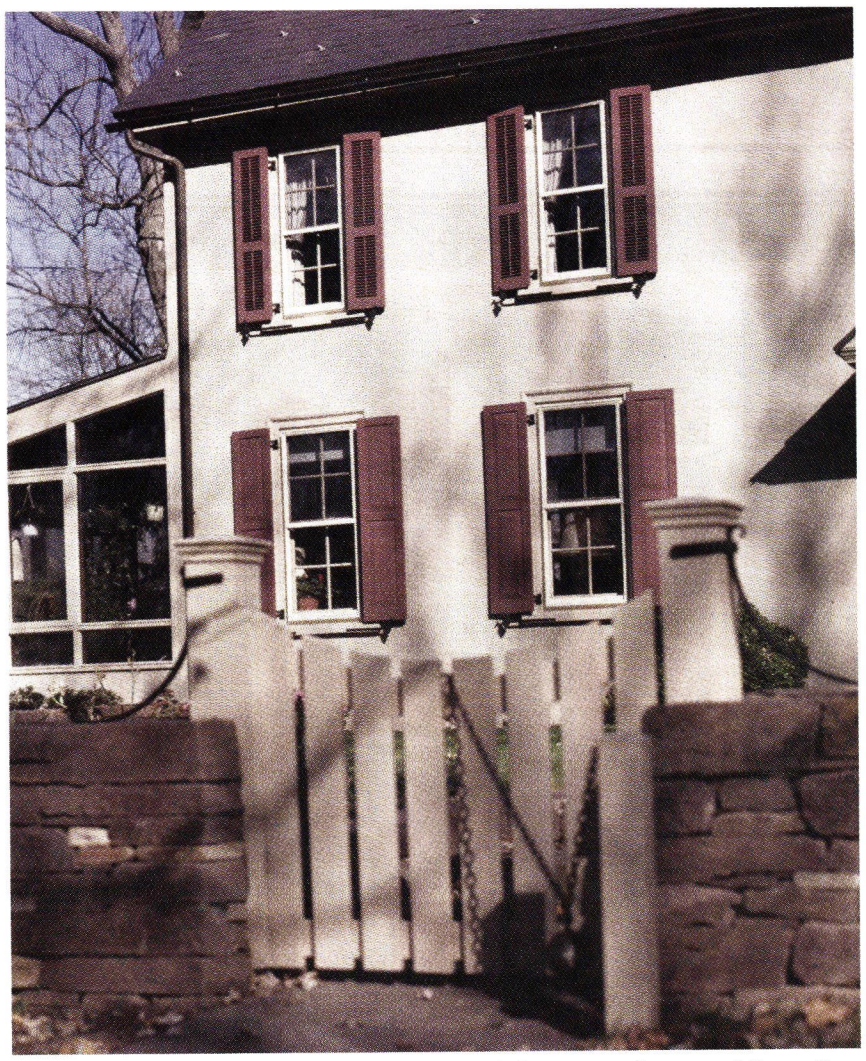
WRITE IN NO. 1288

Window Dressing

Interior and exterior shutters and blinds for historic houses have experienced resurgences. *By Roberta Lane*

The desire to bring light and air into homes has resulted in a progression from the small casement windows of the First Period, to the more elaborate multi-lite window sash of the 18th and 19th centuries, and finally to the large uninterrupted glass panes installed in many new houses. As windows have grown larger, exterior and interior shutters and blinds have been used to provide privacy and security, prevent light damage to interior furnishings and finishes and regulate interior temperature and glare. The history of shutters and blinds illustrates their utility, versatility and appeal.

The terms shutter and blind both refer to hinged window coverings. Strictly speaking, a shutter is a hinged board or panel construction, while a blind has fixed or movable louvers. In general parlance, though, the distinction has blurred, and today the word shutter encompasses both types of covering.



Timberlane Woodcrafters supplied the louvered shutters on the second floor of this residence as well as the paneled shutters on the first floor.

Exterior Subtypes

Exterior shutters and blinds have been used from the 17th century to the present. "Shutters were the first storm windows," explains Colleen Murdock of Guilford, CT-based Shuttercraft, Inc., manufacturer of period and reproduction exterior and interior shutters. Heavy single-board and board-and-batten shutter styles, which could be bolted and barred, were typical until the mid-18th century, when lighter, paneled shutters and louvered blinds became common. While shutters were usually paired on either side of the window, occasionally one shutter spanning the entire opening would be hung to one side.

Shutter subtypes proliferated through the 18th and 19th centuries, including bi-fold versions and "Dutch" shutters that split horizontally, so that the top half could be opened for light and air while the bottom was closed for security. More common in hot climates, awning blinds were hinged at the top of the window for maximum shade and air circulation. Exterior shutters were traditionally painted either black or dark green until the mid-19th century. The latter part of that century saw a transition to bolder colors and more elaborate custom designs, such as the pointed shutters made to shield Gothic Revival windows.

Exterior shutters were attached with a variety of hardware, including strap hinges on pintles, locking mortise hinges and even wide-swinging H- or HL-shaped hinges. An assortment of latches were used to close exterior shutters, but the most common devices to hold them open were shutter dogs, metal fasteners that turn on a lag screw or drive nail attached to the window sill or sidewall. A range of shutter dog styles were employed, from stars to darts to S-shaped hardware. According to Bob Woodard of Philadelphia, PA-based James Peters & Son, Inc., manufacturer of period and reproduction hardware, "even among the S-shapes there was a lot of local variation, because the local blacksmith would shape it his own way."

Vixen Hill manufactured the old-growth red cedar shutters for this stone house.

The functional use of exterior shutters declined late in the 19th century, as the combination of interior window coverings and exterior storm windows proved more convenient and effective. Although no longer central to the working life of houses, shutters remain popular decorative elements, framing window openings and providing depth and texture. Now that exterior shutters are almost always left open, they have transcended their original use and meaning to become a charming and welcoming detail.

Even in the absence of surviving exterior shutters, windows, frames and sills often retain signs of shutters past, such as holes that once held hardware, built-up paint outlining patterns of shutters or hardware or surviving pieces of the hardware itself. By using these physical signs and historic photographs, missing exterior shutters can be replaced with great accuracy, restoring the grace that the shutters once brought to a façade. Today's owners are savvy about the nuances of installation, pattern and material as they seek to reproduce the effect of historic shutters. Even if the shutters will never be closed, there is an increasing appreciation for the historic and visual authenticity of solid-wood shutters that are appropriately sized for the inside of the window opening, and hung on operable, correctly placed hardware. Christopher Peeples of Elverson, PA-based Vixen Hill, manufacturer of period shutters, explains that owners and contractors "are much more discerning about shutters; they understand that working shutters have a three-dimensional look, a shadow line that you can see from a mile away – entirely different from the vinyl panels that just get tacked on the sides of windows."

Manufacturers of period and reproduction shutters and shutter hardware can attest to the expanding market for shutters as historically-appropriate details. While the demand for working, period hardware and solid-wood shutters was once limited to museum houses, David Kayne of Candler, NC-based Kayne & Son Custom Hardware, Inc., reports that his family's firm is providing hardware for more and more private homes. He notes that property owners are seeking out "traditional patterns that match the period of their houses, particularly in the eastern part of the country." Woodard notes that quality, operable shutter hardware is becoming more popular even in new construction, "especially because people down South want to have working shutters for hurricane protection."

"While there is a great trend toward using functional, wood shutters in new construction," says Rich Heggs, vice president of sales and marketing with North Wales, PA-based Timberlane Woodcrafters, manufacturer of hand-crafted custom shutters, "renovation and restoration continue to be huge, booming areas for Timberlane." Because of the great variation in regional types through time, Timberlane offers a full range of shutter styles and hardware that are based on regional examples. "In New England, louvers were wider than in other areas; in Center City Philadelphia, you saw ladder-style everywhere and then there was the difference between urban and rural versions, with more ornate shutters in the cities," he says. There is a portion of the market that notices these differences and seeks the most accurate designs, he adds. "There has also been a lot of interest in custom shutters to fill special window shapes, pointed arches and 'tombstone'-shaped windows." Like all of the manufacturers, Timberlane "intends that the shutters will last a lifetime," and uses traditional mortise-and-tenon construction to create solid-wood exterior and interior shutters.

Authentic Interiors

Interior shutters, a convenient alternative to exterior shutters, were extremely popular from the 17th- through the early-20th century. In their earliest form, they were used to keep out wind and rain in lieu of expensive glass windows. The most common early type consisted of a single panel that slid on a track running across the bottom of the window and the surface of the wall. This model was gradually refined, with single or paired shutters that could be slid out of sight into pockets in the wall. The most elaborate featured a second track halfway up the length of the window, so that a total of four panels could be adjusted as needed. While pocket shutters came to be called "Indian" shutters in the 19th century, their widespread use actually began well after settlers' conflicts with native populations subsided.

During the 18th century, fashions changed and interior walls were brought further into rooms to cover exposed timber-framing members, creating deep recesses around window openings. The thick walls of masonry houses also had this kind of recess. Folding, paneled interior shutters were made to occupy this space, called the embrasure, as both functional and beautiful elements of the interior woodwork. These "boxed" shutters folded seamlessly into shallow pockets in the wall, creating a paneled surround at each window.

From the late-18th century through the end of the 19th century, louvered interior blinds were very fashionable window treatments. Those with narrower slats were available in the same configurations as paneled shutters, such as the Dutch and bi-fold styles. One creative type had multiple panels that slid vertically, held

These arched-top, louvered wood shutters and shutter dogs were manufactured by Shuttercraft.

in place by pegs or clips to cover the window, or concealed behind window seats when completely open.

Historically, the term Venetian blinds was applied to any number of interior and exterior treatments, but it now connotes any louvered interior blind with movable, wide wooden slats, either set in a frame or suspended on cloth tapes from the top of the window. Venetian blinds were prized because they could fan out to fill the semi-circular shapes of fanlights or Palladian windows. Early versions often had clear finishes to expose the wood graining, but they soon began to be painted dark green or black like their exterior counterparts.

Wooden interior shutters and blinds fell out of favor through the 20th century, as cheaper metal mini-blinds and other treatments became available. As has been the case with exterior shutters, however, there has been a resurgence of interest in authentic interior shutters, and the beauty and utility they impart. Murdock explains that "there has been steady growth in the market for interior, as well as exterior shutters." For those who are not fortunate enough to have surviving historic interior shutters, a range of accurate period-style shutters are available.

While all of these exterior and interior window coverings are fundamentally simple in concept, for centuries they were essential to maintaining a comfortable household. Today, they evoke a time when striking the balance between shelter and nature was a manual, circadian ritual. Though their role has changed, they retain their significance, both as examples of changing tastes and technologies, and as beautiful architectural details. ■

Kayne & Son fabricated this clamshell shutterdog, which was cast in brass.

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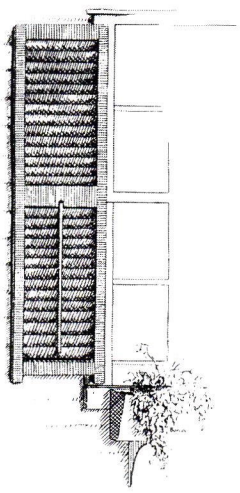

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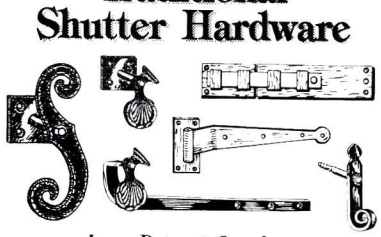

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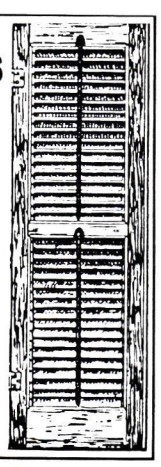

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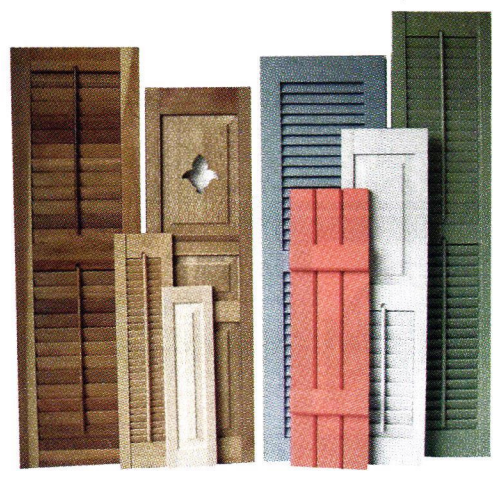

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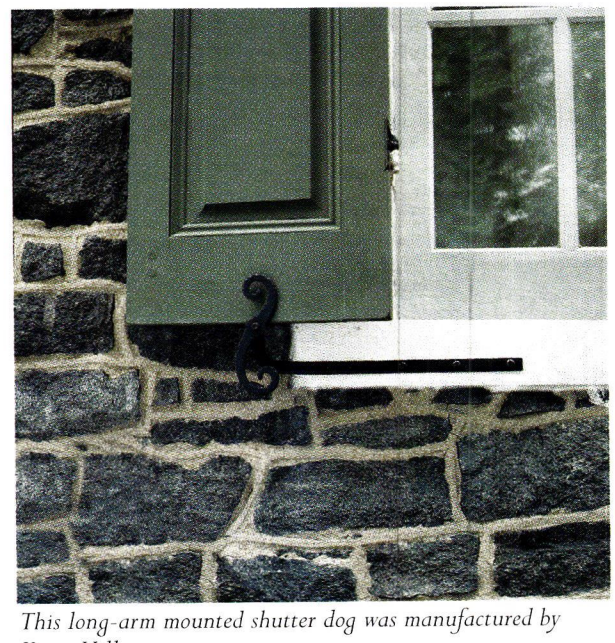

This long-arm mounted shutter dog was manufactured by Vixen Hill.

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The Cutting Edge

The old specialty glass techniques such as wheel cutting and engraving are alive and well, thanks to skilled artisans around the country.

By Martha McDonald

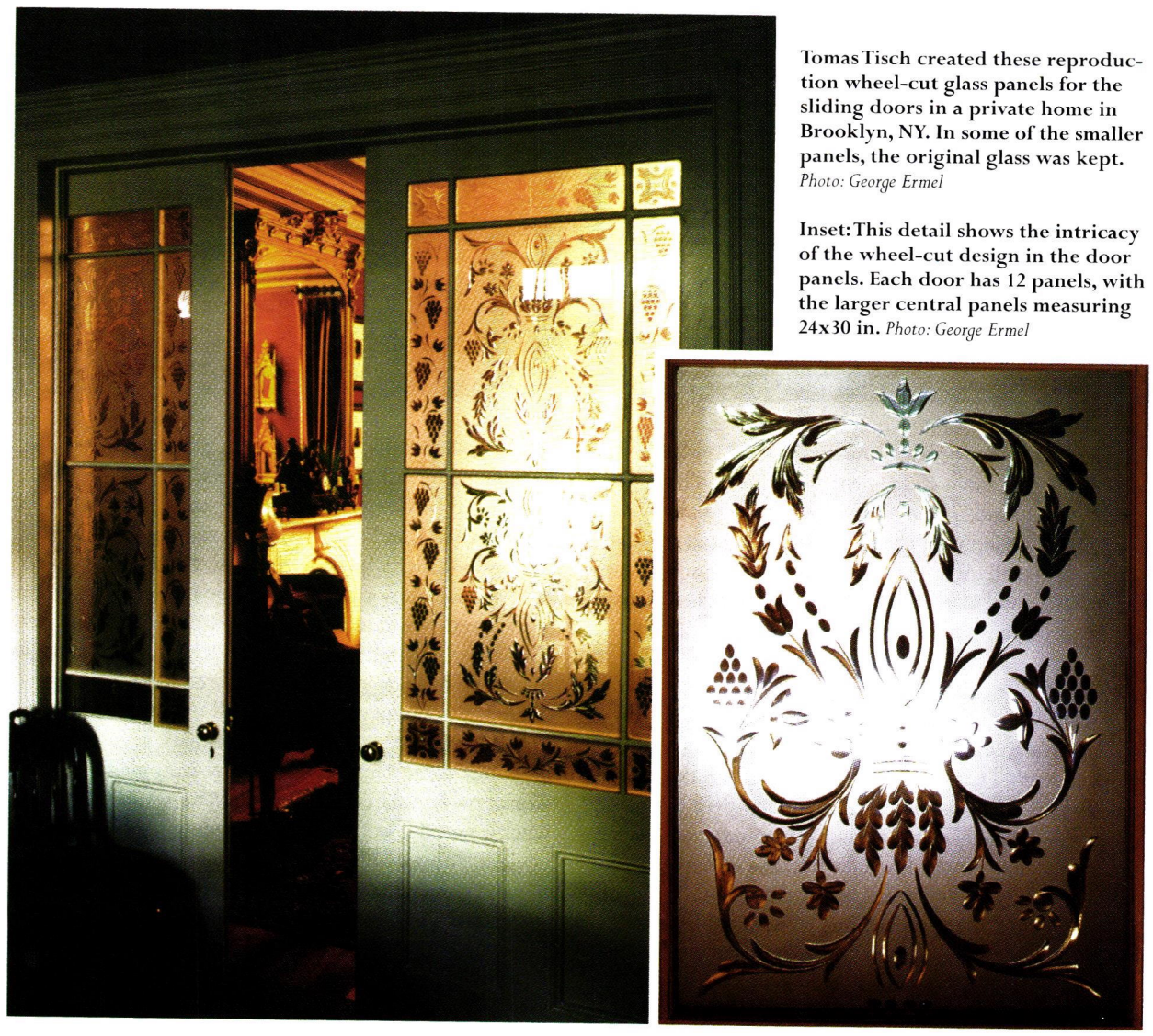
Architects and designers looking for specialty glass, whether for doors, windows, cabinets or other residential applications, will be happy to know that a wide variety of options are available. These range from reproduction glass designed to match the glass used in historical homes to custom wheel-cut decorative panels for Victorian-style brownstones and mansions.

Companies such as Hollander Glass of Downers Grove, IL, and Advantage Glass of Torrington, CT, offer reproduction historical glass, sometimes known as wavy glass. Restoration glass distributed by Hollander, for example, is produced using old-world techniques and is used primarily in restoration and renovation projects that call for glass with imperfections. The firm's mouth-blown Old World Colonial glass is suitable for projects seeking to reproduce pre-1900 glass. It is available in three categories: Light Restoration Glass, Medium with cords and Heavy with reams.

Machine-drawn restoration glass from Hollander is suitable for projects seeking to reproduce glass as it was made from approximately 1900 to 1950. Offered in the Restover and Retroverre styles, this glass features a subtle wave with no seeds or defects and is available in 1/8- and 3/16-in. thicknesses. The third type of restoration glass from the firm is rolled. Called ReNova, it features a gentle wave, subtle distortion and limited seed content, and is described as a glass offering antique characteristics at a more affordable price.

Custom Cutting

Meanwhile, highly skilled artisans in various parts of the country can provide most any type of custom glasswork. One of the most experienced of these artisans is Tomas Tisch, who has a studio in Brooklyn, NY. Tisch originally taught glass cutting and polishing under Marvin Lipofsky at the California College of Arts and Crafts in Oakland, CA, before opening his own studio in 1978.

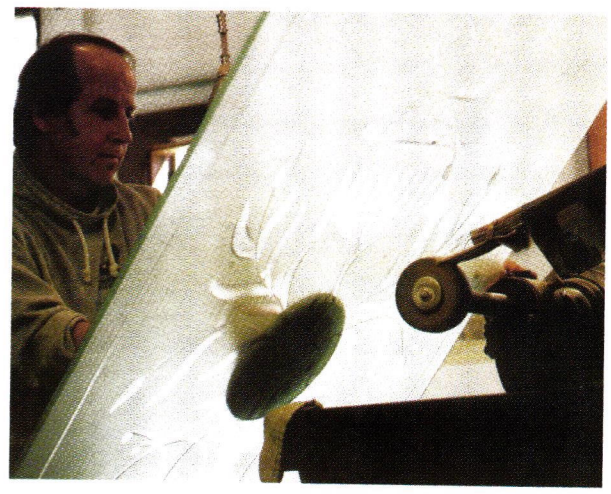


Tomas Tisch created these reproduction wheel-cut glass panels for the sliding doors in a private home in Brooklyn, NY. In some of the smaller panels, the original glass was kept. *Photo: George Ermel*

Inset: This detail shows the intricacy of the wheel-cut design in the door panels. Each door has 12 panels, with the larger central panels measuring 24x30 in. *Photo: George Ermel*

"We do many types of custom work, but we specialize in wheel cutting and engraving," says Tisch. "Wheel cutting is the oldest technique for shaped glass. It developed from lapidary work 4,000 years ago in Egypt. The tools have adapted and throughout the years." He points out that the tools and techniques used for architectural glass cutting are the same as those used for crystal. "As a designer for Steuben Glass, I used the same tools I use now," says Tisch, noting that he has hundreds of wheels, tools that are somewhat difficult to obtain. "I have been working with glass since I was born and working in the U.S. since I was 22," he says, "and I still have wheels from that time.

"Wheel cutting has been out of fashion and hasn't been available for a while, but American art is rediscovering this heritage," Tisch says. "That has been ongoing for the last 10 to 20 years and it is only going to get stronger. People are more interested in preserving than in tearing down. It's an amazing technique and I am willing to work with anyone with new ideas – I still discover new things."

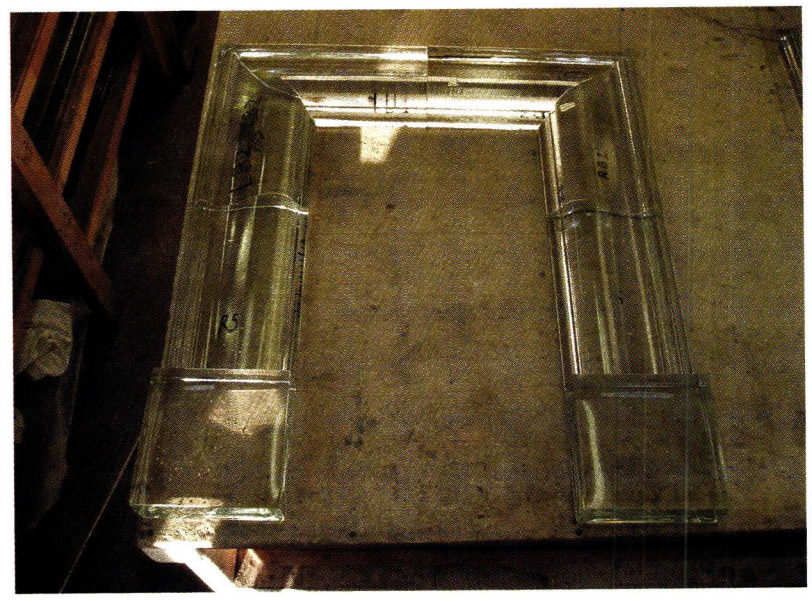


Above: Andreas Lehmann wheel cuts a Victorian-style divider panel. The process requires special equipment, including a multitude of engraving wheels.

Left: Lehmann beveled and wheel cut this starfire leaded-glass entryway in the French Country style for a private residence.

Left: These are a few of the 150 handmade reproduction glass pieces created by Michael Davis Stained Glass for a courthouse in New Jersey.

Below: This one-of-a-kind cast-glass mantel was fabricated by Michael Davis for a private residence. It was made to specifications for Robert A.M. Stern Architects.



Tisch tends to use low-iron glass, which he describes as a very clear glass that doesn't have the green tint found in most new glass. Originally, glass for wheel cutting was usually 1/8-in. thick, he explains, but Tisch usually works on 3/16-in. glass, a compromise between 1/4 and 1/8 in. If there is a concern for safety, the glass can be laminated after it is cut.

Victorian Reproductions

Another well-known glass artist is Andreas Lehmann of Lehmann Glass Studios in Oakland, CA. He worked with Tisch for many years before the latter moved to New York, and specializes in wheel-cut glass used in door panels, entryways, transoms, glass partitions, cut-glass globes for light fixtures and any application where plate glass is used in the home. "A lot of the work I do is reproductions of original Victorian-style glass," says Lehmann. "Many companies did this type of work from 1880 to the 1920s and then they disappeared. Wheel cutting is very rare in the United States. People are becoming more aware of these products and skills," he adds, "and now, with the internet, it's easier for people to find us."

Trained in Germany, Lehmann came to the United States in 1981 and now owns several hundred German cutting wheels, which he finds in discontinued factories. "These are not readily available because they're for such an old-world technique," he explains. His shop staff consists of himself and his wife, Cynthia. The studio manufactures original designs as well as period reproduction wheel-cut glass for jobs all over the country.

Lehmann uses straightforward plate glass for most jobs, but some clients specify low-iron glass. He also works on laminated glass. The average job takes four weeks, he says, but it can vary widely from project to project. Most of his work is done in his Oakland studio and shipped to the site. "I will travel," he says, "but any contractor or carpenter can install the glass. Everything is custom packed and shipped air freight."

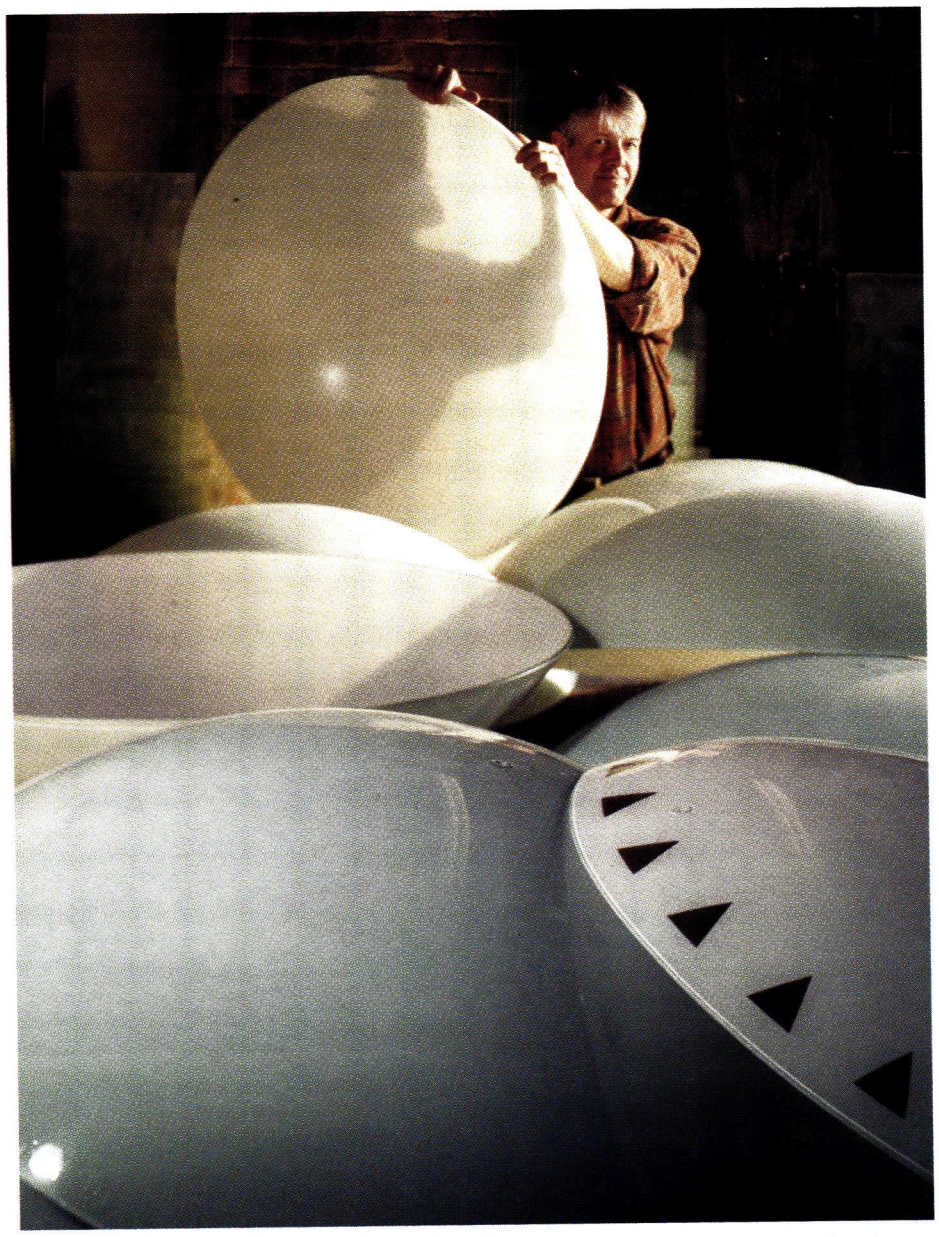
One of the biggest challenges Lehmann faces is educating clients. "Most people don't know what wheel cutting is. They call everything 'etched glass,'" he says. "I have to educate them as to what is sand blasted and what is wheel cut, but when they compare them, they are usually blown away with the wheel cut."

Blown, Fused, Cast, Bent

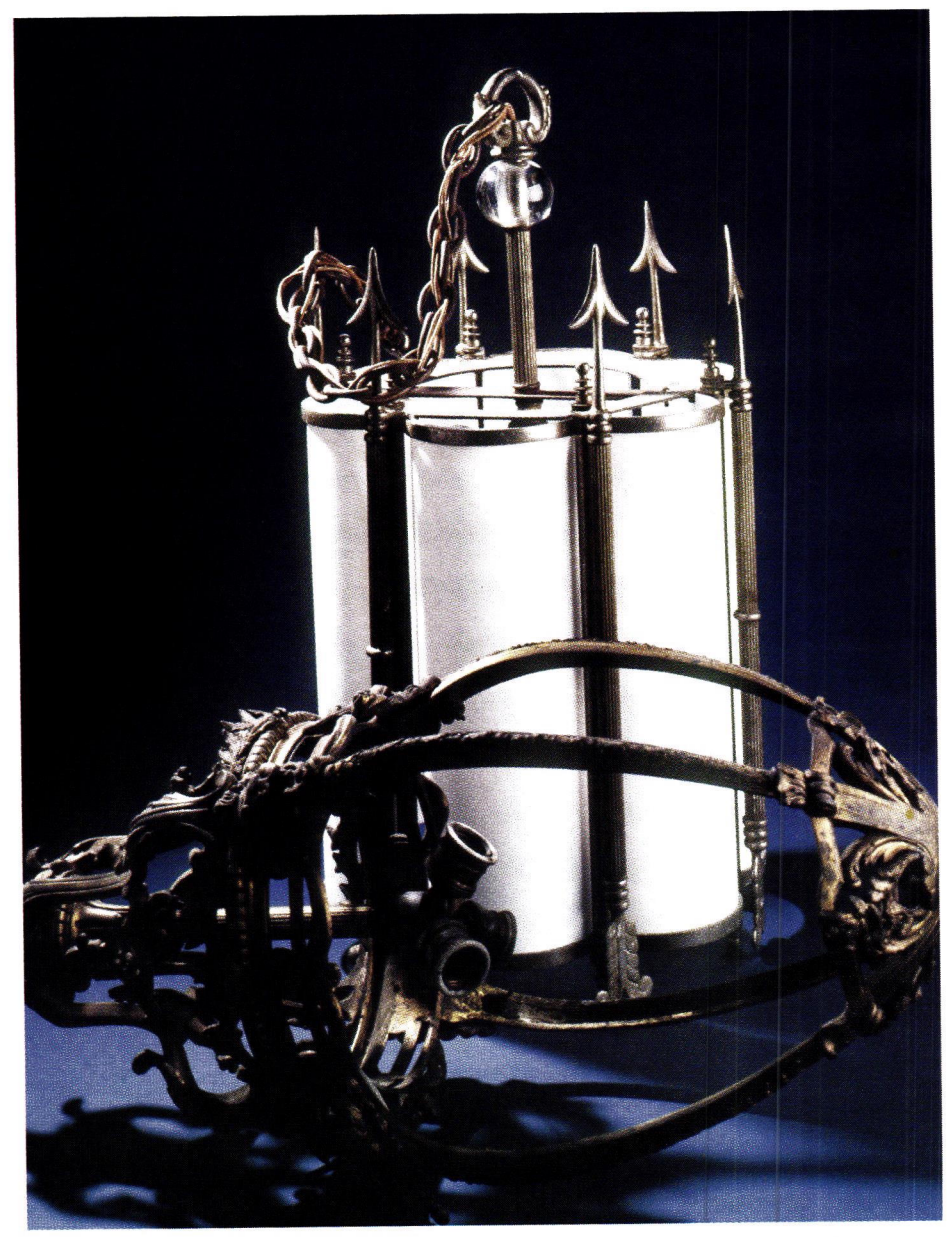
Another glass craftsman with a broad range of capabilities is Michael Davis of Michael Davis Stained Glass, Long Island City, NY, who does restoration and replication of historic lighting. "We do lots of specialty glass, stained-glass restoration, new works, blown glass and new work where the architect or designer wants a light built to their specifications," says Davis. "I do blown-, fused-, cast- and stained- glass projects."

Davis recently fabricated 150 handmade light fixtures for a courthouse in New Jersey. "We generated a few samples before we got a good match," he says, "but now it's almost impossible to tell the originals from the reproduction glass fixtures."

Davis also recently completed a cast-glass mantel for a residence in California. "My advice to architects and designers is to consult the fabricator as soon as



Charles Flickinger of Flickinger Glassworks shows off some of the silk-screened and enameled bent-glass bowls that can be used in glass lighting fixtures.



Replacing the bent glass for historic light fixtures is one of the specialties of Flickinger Glassworks. These two fixtures in the shop show one restored and one waiting for completion.

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R Squared Antiqued Mirror Glass Co. fabricated the antiqued mirror glass and frames for the 4x5-ft. mirrors and for the column for the Rue de Jean Bistro in Charleston, SC.

you can. It can save a lot of frustration if you have a design that's easier to fabricate."

If you're looking for bent glass, Charles Flickinger of Flickinger Glassworks in Brooklyn, NY, is a well-known source. Bending involves heating flat glass on a steel mold until it melts and takes on that shape. "I have 6,000 steel molds and four ovens," says Flickinger, who adds that his work includes restoration lighting and new designs.

Flickinger launched his business in 1986 and now has 11 people working there. "We have a small specialty niche," he says. "There will always be somebody out there who wants what we do as long as we do quality work." While a lot of his work is for cabinetry and display cases for stores such as Tiffany's, he also restores furniture and lighting and does original work for architects. "We also do a lot of bent-glass sashes for old brownstones," he adds. Custom architectural glass such as glass canopies and bent glass for a lighthouse restoration and for revolving doors are also among the firm's capabilities.

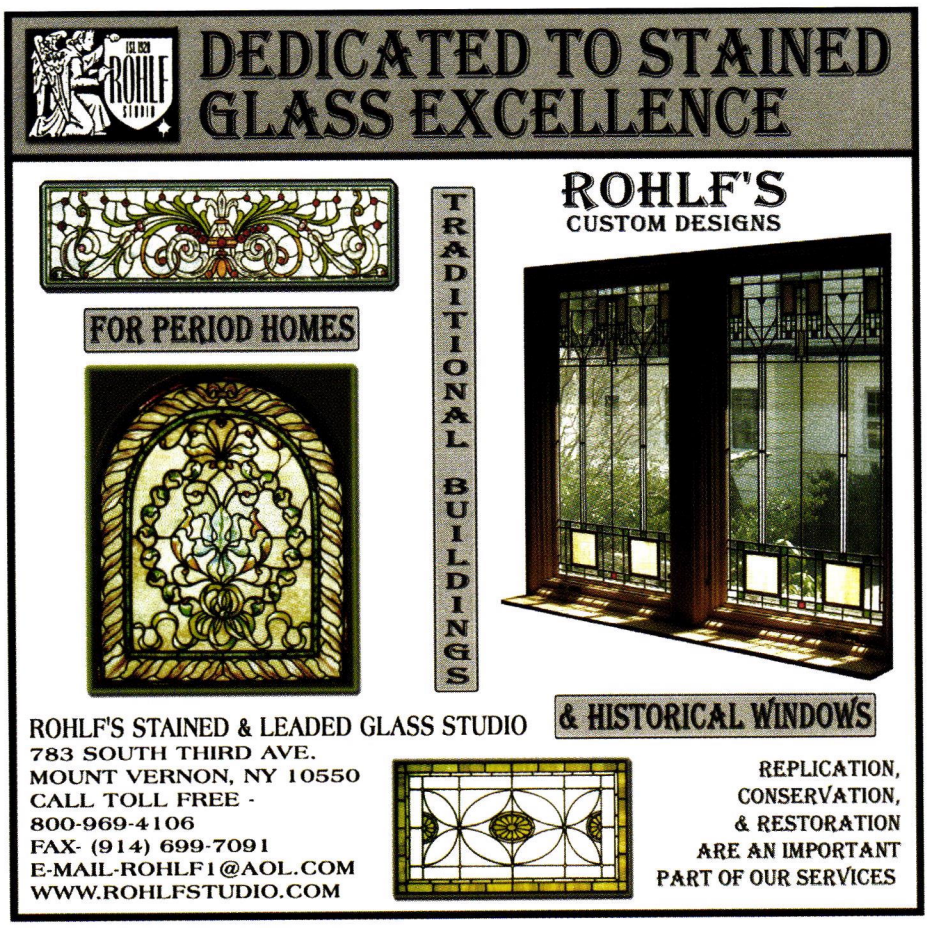
Mirror Glass

A glass artist who specializes in reproducing antique mirrors is Robert Hines of R Squared Antiqued Mirror Glass Co. in Charleston, SC. "We make new mirrors that look old," says Hines. "We start with clear glass (either machine float or hand blown) and silver the glass. We patina the silver and then seal it with a coating that protects it and keeps the patina at a certain level. It's an art and a bit of chemistry," he says of the process that he developed during a period of about 2½ years.

"I have been working with glass for about 25 years," Hines explains, adding that the antique mirror process is about five years old. "The mirror business started when customers wanted antique mirrors for old frames. I started collecting antique mirrors and realized that there was a demand for larger sizes. That's when I started making them."

Hines explains that in the old days liquid mercury was poured on glass to create mirrors. "We use silver now. It is still toxic, but less so. You have to be careful."

Another toxic glass process that is no longer practiced is acid etching. "I don't think there's anyone who does acid etching," says Tisch. "It's very dangerous and requires a lot of equipment." ■



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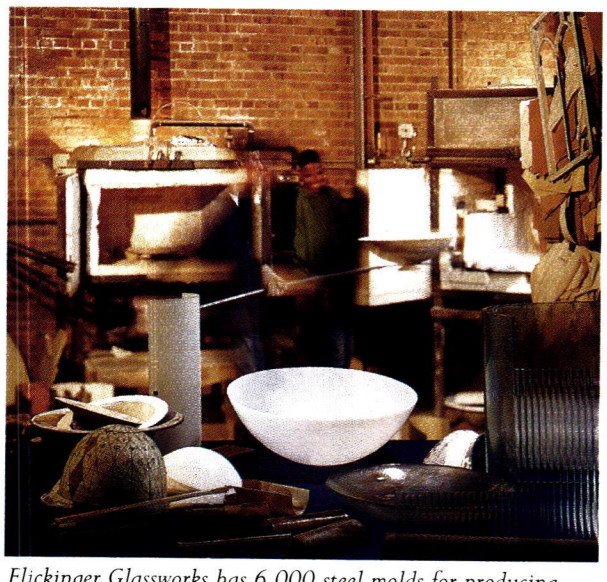

Flickinger Glassworks has 6,000 steel molds for producing bent glass.

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Lehmann Glass fashioned this cut-glass divider panel, measuring 38x58 in., for a historic building in Aspen, CO.

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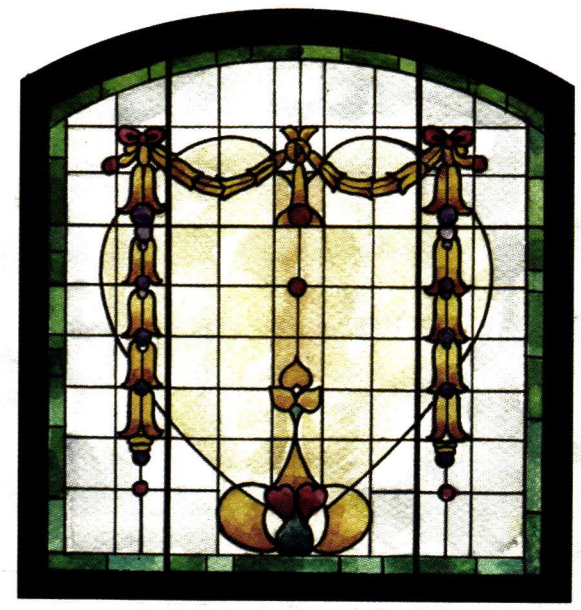

Rohlf's provided the stained glass for this arch-top installation in a residence.

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Tomas Tisch wheel-cut this blue flashed glass in a traditional New England-style pattern.

Tru-Vex provided the bent glass for this decorative cabinet.

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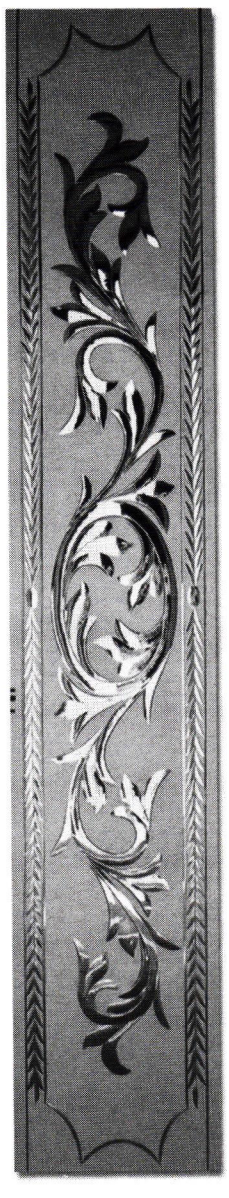

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These pine, fixed round-top units were manufactured by Grabill for a restoration project.

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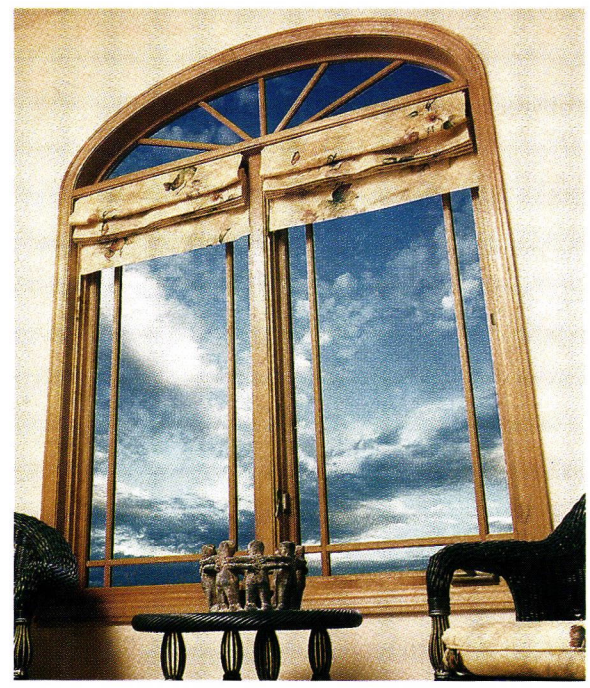

These maple Tudor casement windows from Pollard Windows' Liberty Collection are enhanced with divided lites and an elliptical transom.

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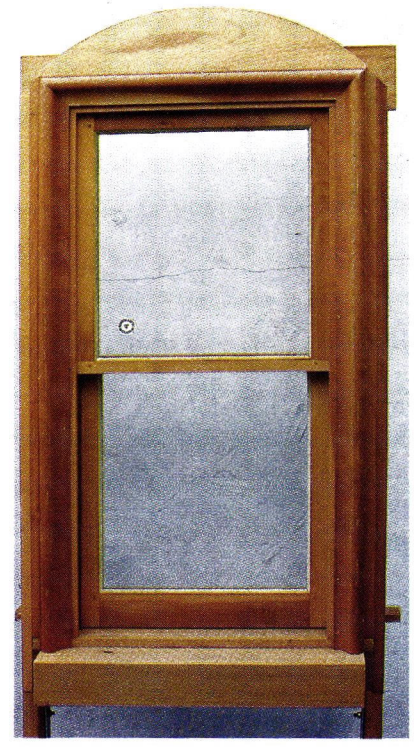

This custom-fabricated double-hung window from Weston Millwork is typical of the company's reproductions of historic windows.

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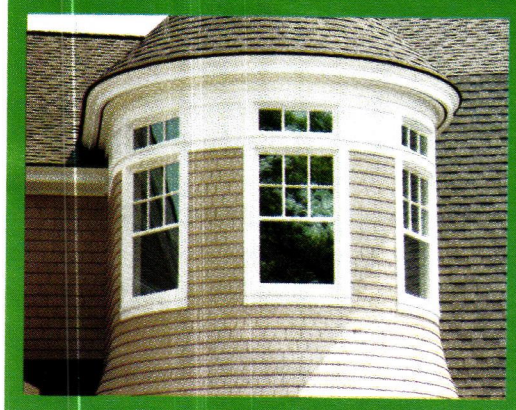

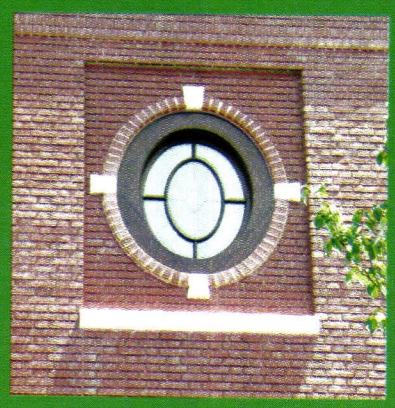

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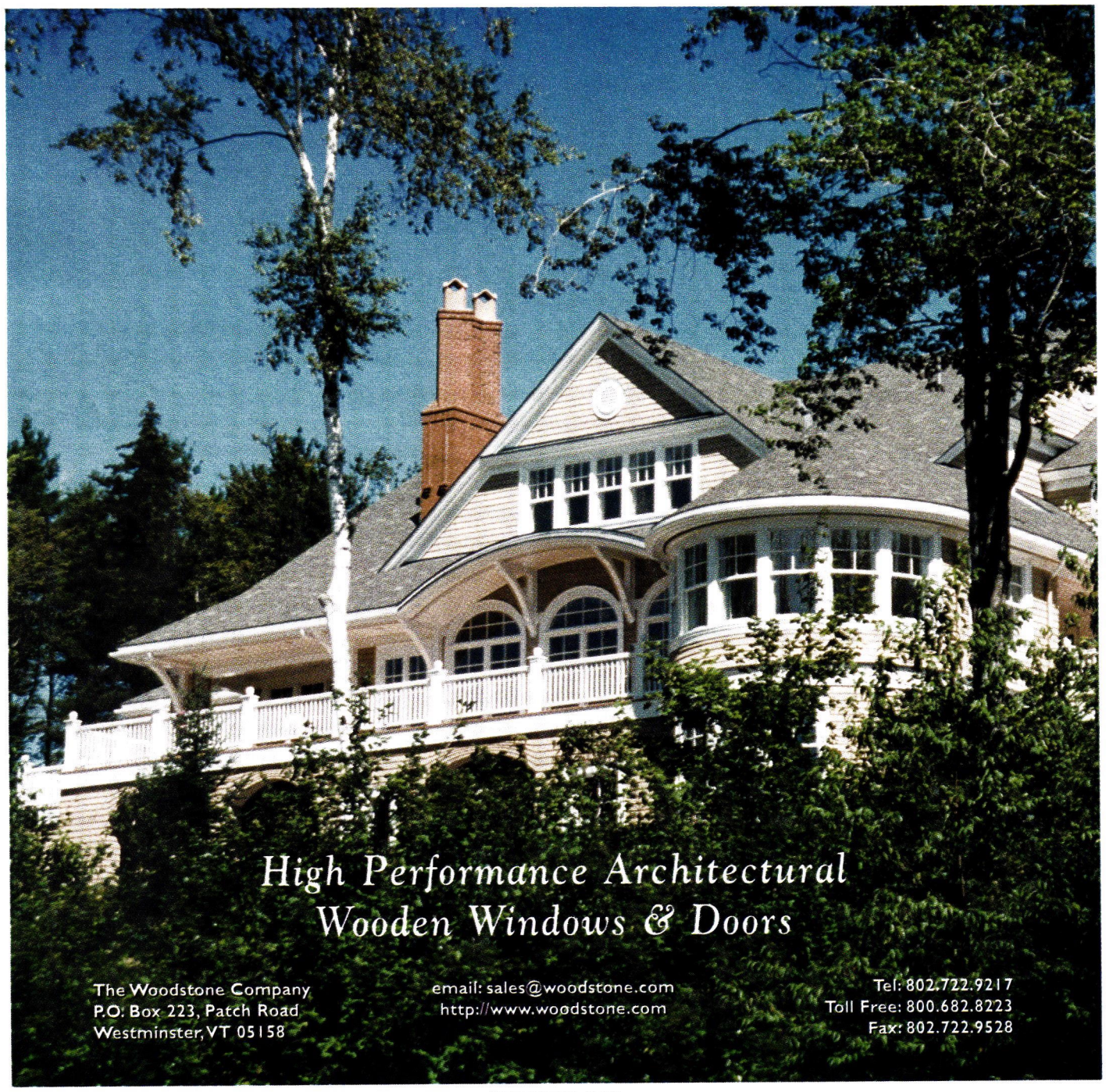

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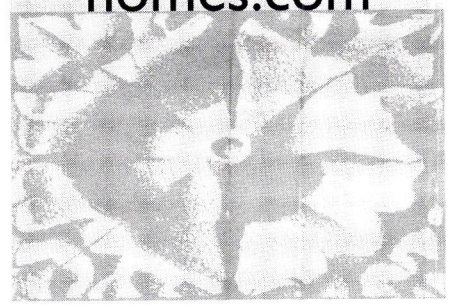

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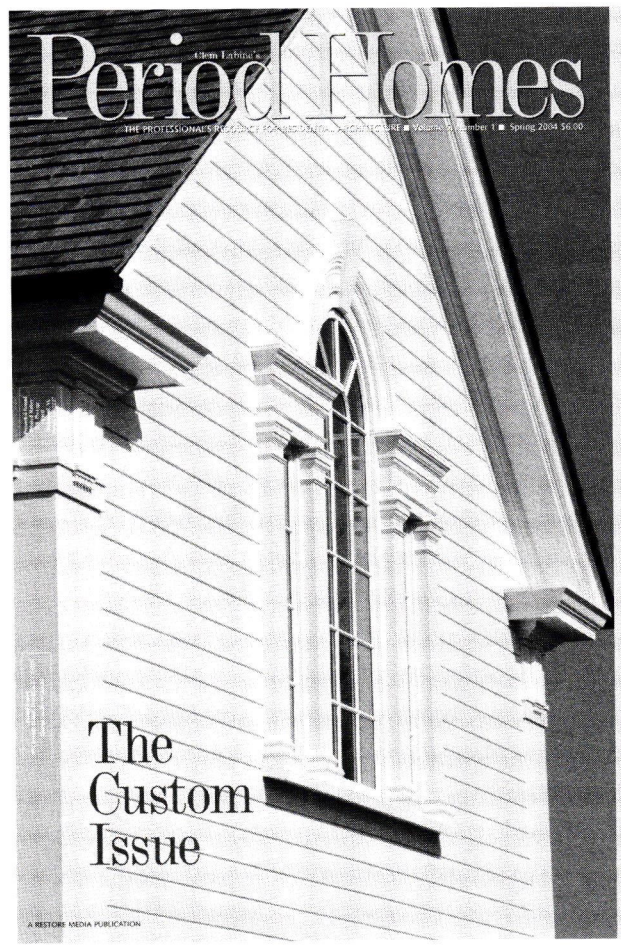

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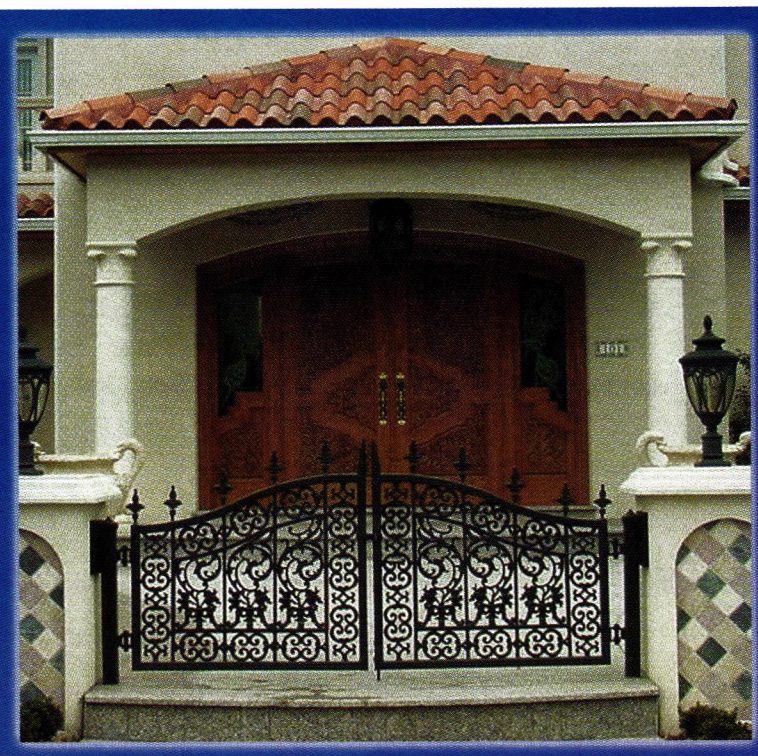

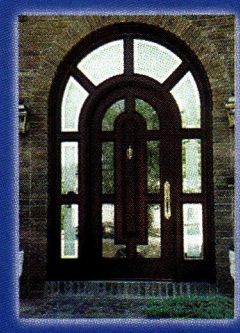

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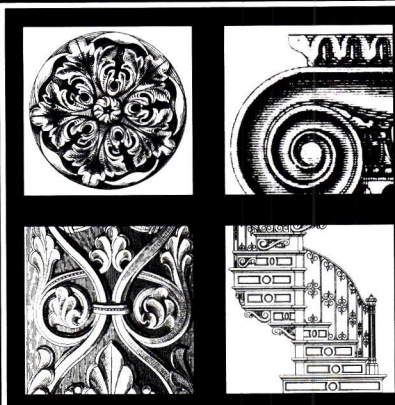

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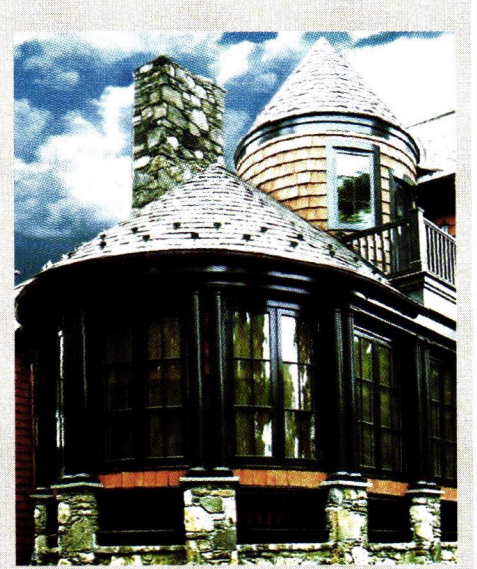

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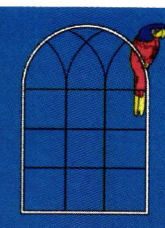

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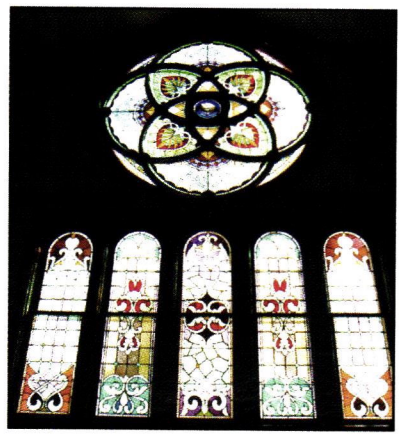

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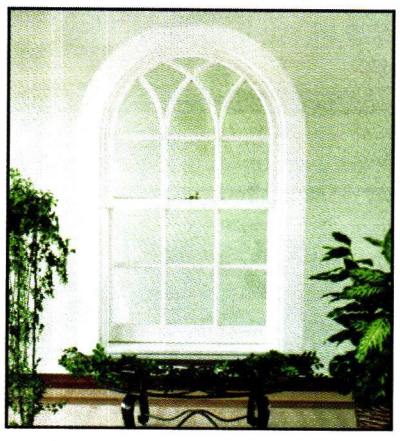

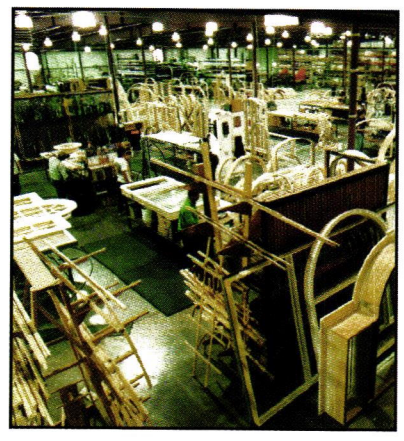

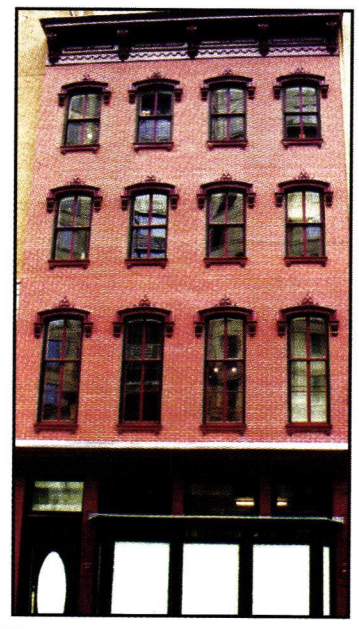

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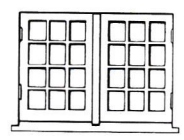

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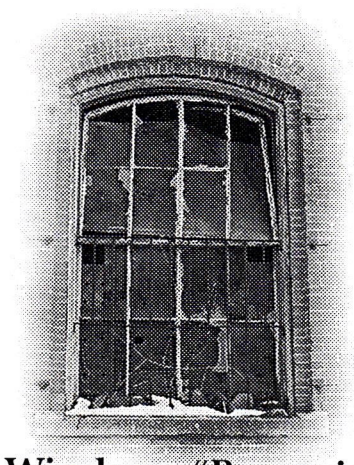

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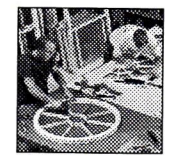

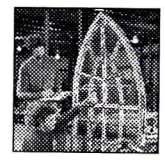

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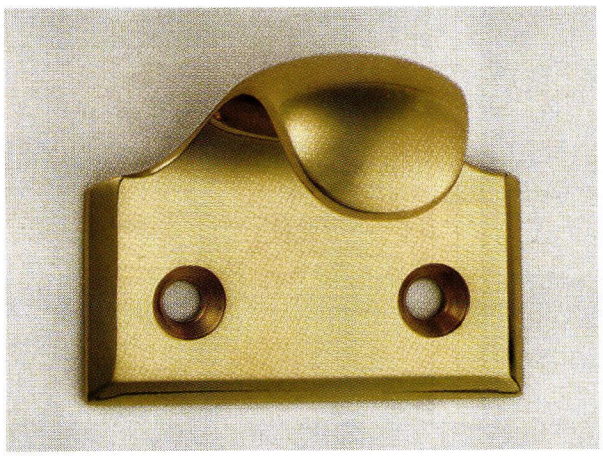


An often overlooked, but necessary component for windows, are sash lifts. This solid-brass model is from Phelps Company.

have occurred through the decades. The basic concept of window latch hasn't changed much in 200 years; however, its form, materials and ornamentation have evolved with technological advances.

In the years before the industrial revolution, most pieces of hardware were individually created from hand-wrought iron. The 1840s marked the arrival of the technology for casting metal and thus mass-production arrived at our collective doorsteps. While not only making hardware affordable for the newly forming middle class, it also allowed everyone to enjoy a level of higher ornamentation achieved without huge amounts of hand work, a trend that continued throughout the 19th century.

While the availability of highly-ornamented reproduction window hardware currently exists, one should avoid the temptation to select pieces that are inappropriate to the period of interpretation. Just as using a Colonial-style piece in a Victorian window would be incorrect, the use of a fanciful 1880s latch in a pre-1870s parlor would look inconsistent with the more restrained aesthetics of the period. While the fanciful 1880s style pervaded building well toward the turn of the century, there was an immediate change to a more simplistic style thereafter.

This is true of other window hardware as well; purists and those who find themselves charged with creating a higher degree of authenticity would do well not to overlook sash pulleys. While many modern replacement windows negate the need for the traditional sash-weight pulley array, the historic market often finds their use dictated for a believably accurate installation. Fortunately, this need has been addressed by several manufacturers that not only produce a wide range of pulleys in various degrees of ornamentation, but also replacement sash weights in stackable increments that preempt yet another trip to the salvage yard in search of matched sets of rusty vintage sash weights that are usually piled willy-nilly in some dark corner. This is especially useful when working with commercial-sized sash such as those found in old schools and lofts where the Damoclesean potential of an open sash must be addressed with exceptional care.

Likewise would be the professional's approach to the more esoteric pieces of hardware such as transom and casement hardware; although their existence may be easy to overlook, their inclusion in a project lends authenticity as well as function.

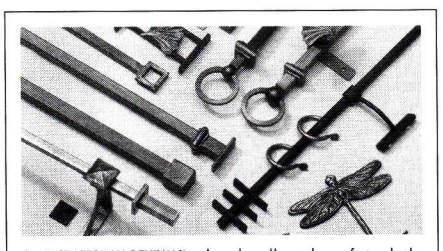
An aside on shutter placement: one would think that with almost 30 years' worth of attention being focused on historic preservation, professionals would know how to properly install exterior wooden shutters: The hinges, and thus the inner vertical edge of the shutter, should be on the inside of the window casing, as if they could actually close and seal the window. To be truly accurate, when shutters are left affixed to the exterior walls, the louvers should be slanted up and toward the outside. If they are not, should the shutters be theoretically closed, they would then drain water into the house during a rainstorm. This advice may seem nitpicky, but rest assured that every scholarly type will be quietly smirking at your expense if you do not heed it, regardless of how much you spent on fancy shutter hangers and latches.

An example from Crown City's inventory of unusual items: a cast-iron sash holder.

High-quality crescent-style casement fasteners are difficult to find; this brass model is from Crown City.

Crown City offers window pulleys in brass or iron, and accompanying nesting sash weights to incrementally balance heavy window sash.

Finally, for those rolling their collective eyes at this point, another even more seemingly insignificant touch that purists demand: please use slotted screws – the Phillips head screw was not in use until the late 1930s at the very earliest. ■



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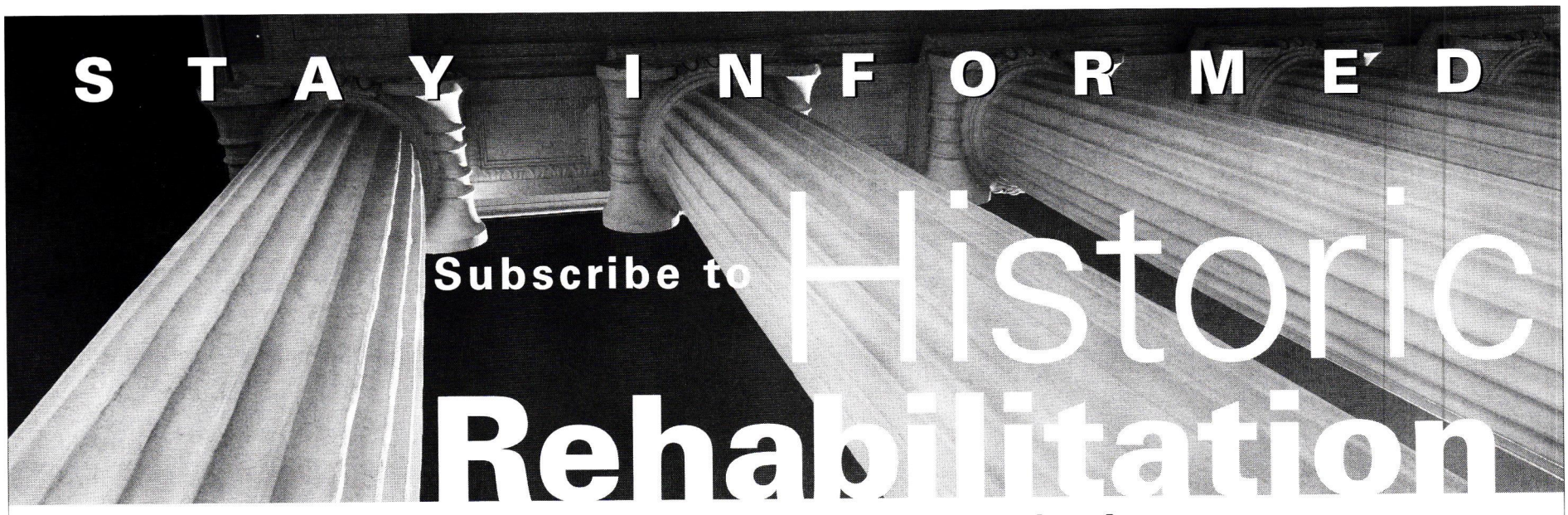

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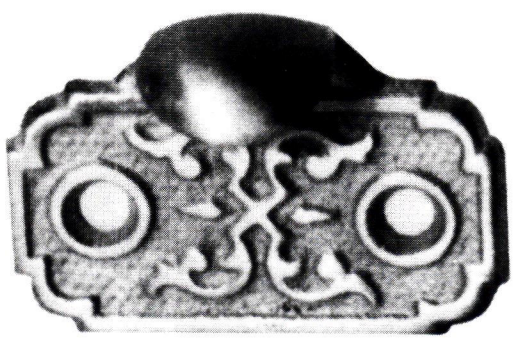

This cast-brass sash lift from Ball & Ball Hardware measures 2x1 in.

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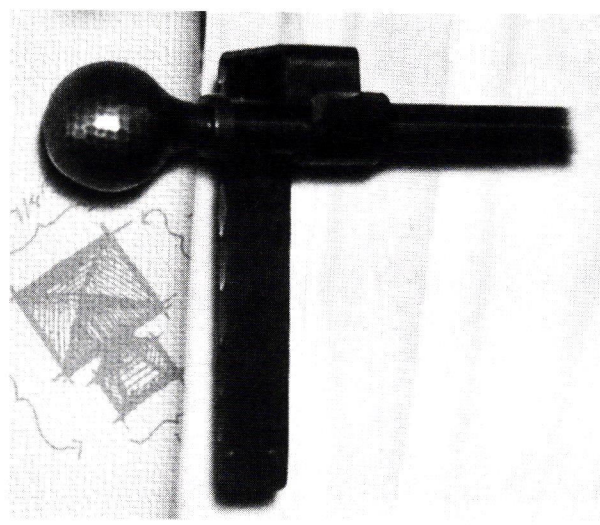

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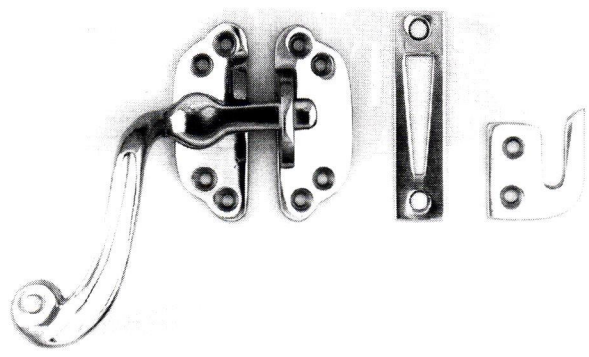

Crown City Hardware manufactured these stainless-steel casement fasteners, from left to right, models #82A-L, MS and RS.

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Who's Afraid of the Golden Section?

The role of number and geometry in design is mysterious to many. It needn't be. *By Steve Bass, Institute of Classical Architecture & Classical America*

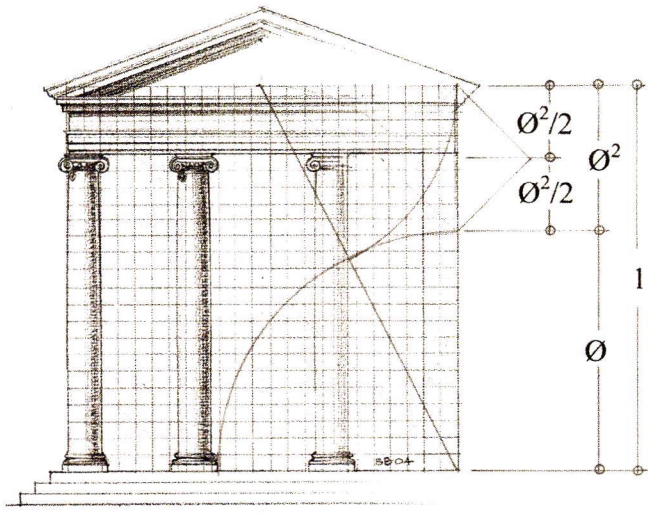
The use of proportion in Classical and traditional design is considered by many to be the most difficult and opaque aspect of what seems, on the surface, a rational and enlightened subject. Some consider proportion a form of superstition, others liken its study to a kind of slavish cowering before the cruel masters of the canon, a few speak darkly of madness. To begin to understand why such views are widespread even within the contemporary Classical movement, we might note the existence of a rational-romantic polarity within the human personality.

In general, the rationalist seeks knowledge out in the open, or externally, while the romantic is willing to grope around in the dark, or internally. As it affects design, this polarity cuts across the stylistic lines that exist within Modernism as well as Classicism. We see the spectrum in Modernism comparing work of Mies van Der Rohe and Alvar Aalto.

Within Classicism, this polarity is expressed in the attitude toward the material that makes up the canon: the reference books that describe the elements and the orders. This use of historical references and pre-existing elements are often cited by those who extol the "rational," or measurable, aspects of the Classical.

Yet, if we construct a four-column portico, following the seemingly rational guidelines of Vitruvius, we find underlying Vitruvian arithmetic, the incommensurable geometry of the Golden Section, or phi (Ø). Indeed, the constant references to Plato and Pythagoras in Book III, where the arithmetic system is described, might be seen as a tip off, or an allusion to an unmentioned, or even unmentionable, symbolic geometry. Ø is the ratio 1:1.618... The three dots indicate that Ø is a "transcendental," that is, it transcends the possibility of being completely described by rational means.

A reader's attitude toward Book III is usually revealing of their position on the rational-romantic spectrum. Rationalists find it opaque, fragmented and incomprehensible, or proof of Vitruvius' deficient intellect. Romantics have read profound mysteries between the lines, veiled by words with lost or hidden meanings. In aesthetics, the rational end of the spectrum is associated with the arithmetical, that which is built up of modular units, while the romantic is associated with geometry, that which is found by dividing within a greater unity.



The Portico of Vitruvius shows rational arithmetic and the mysterious Ø ratio.

In the traditional symbolic system, though, such dualities are inherently unstable, requiring a third, structuring element. The resolution of polarity is mediation or harmony – the creation of a third position that establishes a bond, fixed relation or mean between two extremes. Such a harmonic method is described by Plato in his numerical creation myth *Timaeus*. Incipient in the arithmetic of Vitruvius, it was elaborated in the Renaissance by Alberti, Vignola and Palladio. In our time, this idea of harmony in Renaissance design was explicated by Rudolph Wittkower in his book *Architectural Principles in the Age of Humanism*.

The Renaissance approach to harmony in architecture takes the form of the musical analogy. That is to say, the numerical ratios that position the four principle notes of the ancient or "natural" octave are taken as the primary ratios of the architectural elements. The four primary notes in this tetrachord are the fundamental, the fourth note, the fifth note and the octave.

A key discovery attributed to Pythagoras was that these consonant sounds had a numerical relationship. Assuming the fundamental is created by a string one unit in length, called the interval, its octave is created by a string two units in length. This may be described by the ratios 1:1 and 2:1. The interval of the fourth note is 4:3 and the fifth note is 3:2. These ratios are the core of the ancient harmonic system. In the Renaissance, this natural octave was "tempered," that is, the interval lengths of the third and sixth notes were slightly modified. The sixth note took the ratio of 5:3, which may be taken as a whole number approximation of Ø.

These ratios form five of Palladio's seven recommended proportions for rooms, the sixth being the geometrical 1:$\sqrt{2}$ and the seventh being circular. The circle may be said to symbolize unity, expressed in such inclusive, cyclic ideas as nature, time and the soul, while each of the rectangles starting with the square represent specific materializations of unity. To determine the height of rooms, Palladio used the "three musical means," the simplest of which, the arithmetic mean, is better known as the average. Thus a 15x25-ft. room would have a ceiling height of 40 divided by two, or 20 ft. This may be expressed in the arithmetic progression 3:4:5. Each of the ratios 4:3, 5:3 and 5:4 (the position of the tempered third note) are harmonic.

In the great centuries-long struggle between the Ancients and Moderns that followed the Renaissance the musical analogy became associated with the Middle Ages, the obsolete, the backward, the dark and obscure. Proportional design methods remain in disrepute today, valued only by a minority within a minority. Contemporary authors, beginning perhaps with P. H. Scholfield, in his *Theory of Proportion in Architecture*, take what might be called a math-and-metrics-only attitude. Serious scholars like Joseph Rykwert, in his book *The Dancing Column* and Richard Tavernor, in his and Rykwert's analysis of Alberti's church of San Sebastiano, simply refuse to sully themselves with such subjects. Even art historian George Hersey, whose early book *Pythagorean Palaces* was quite respectful to the symbolic tradition, and whose later book *The Lost Meaning of Classical Architecture* was open minded on the subject of the origins of the elements, has in his more recent book, *Architecture and Geometry in the Age of the Baroque*, taken a flippant tone to the subject. A rudely dismissive attitude to the subject is taken by Mark Wilson-Jones in his otherwise reasonable book, *Principles of Roman Architecture*.

This is all too bad, because harmony is related to the achievement of beauty, which may fairly be said to be the primary goal of any Classical art. Beauty, says the Neoplatonic philosopher Plotinus, is the memory of unity. It is not measurable or physical. It is an interior or psychic experience of unity in multiplicity. Design is thus not a reductionist mathematical science but rather a form of poesis, closer to poetry than chemistry, where the whole is greater than the sum of the parts.

A powerful parable of such mysterious unity in multiplicity is found in the ancient Hermetic creation myth, in which life and intelligence arises from the ongoing harmony of matter and spirit. This may be symbolized in geometry by the squaring of the circle, that is, creating a square and a circle with equal perimeters. The key mathematical relationship that yields that dynamic harmony is the Golden Section.

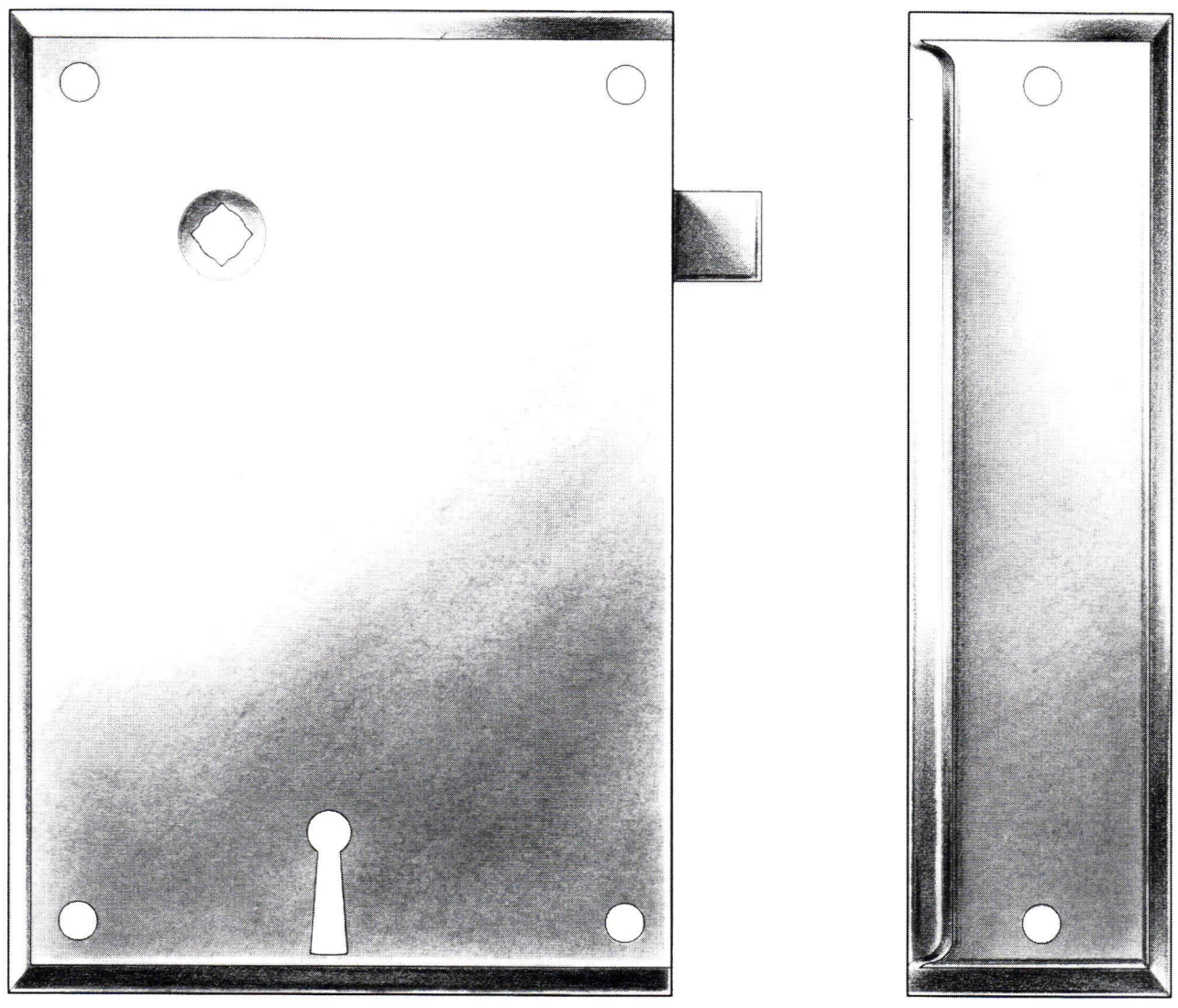
This is perhaps why Vitruvius cites the human body as the proportional archetype of the temple, placing the embodied human being between matter and spirit, where we find it in the famous drawing by Leonardo da Vinci. When we experience phi we are reminded of the possibility of a return to unity.

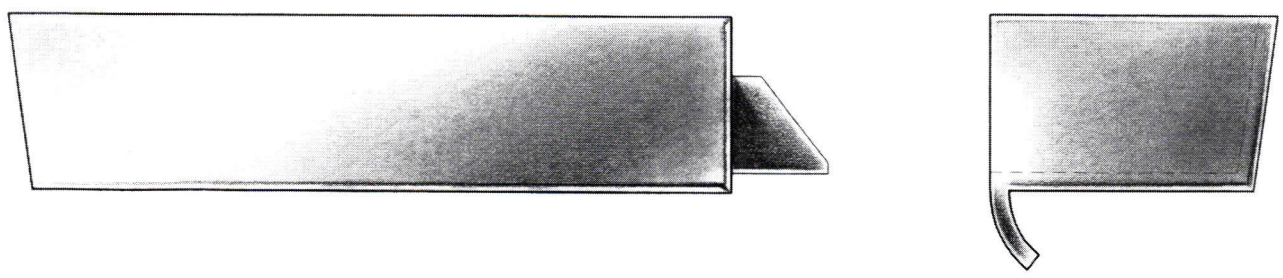
As individuals we have a desire for unity. Harmony guided by number may serve as a reminder of that unity. By designing with phi and other harmonic ratios we can satisfy this desire and stimulate the joyous experience of beauty.

Now, it's understandable that all this talk about the soul, unity and ancient mystery makes many of the more level headed among us a bit, shall we say, nervous? They feel that it must be some sort of a con job, a new opiate for the masses; they fear to be drawn into some Cult of the Golden Section, where their psyches as well as their wallets will come in for a good cleansing.

In fact, you do not have to believe in anything, or prostrate yourself before some guru, to approach beauty through number and geometry. What one must have the courage to do is play the role of the creator, whom Plato called the Demiurge, and allow the unifying power of the Archetypes, Ideas or Forms to flow through you and so become impressed in matter. Start with an archetype of unity, the square or other polygon, and divide it in a harmonic pattern to satisfy the needs of the problem. For our inspiration we might recall the admonition of Socrates to the would-be governors of Plato's Republic – "Those who study the divine order become orderly and divine, as far as human nature allows." ■

If you have an idea that you think would make a good topic for The Forum, e-mail Editor in Chief Michael Carey at mcarey@restoremedia.com. He'll let you know how the idea might be developed for a future issue.





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